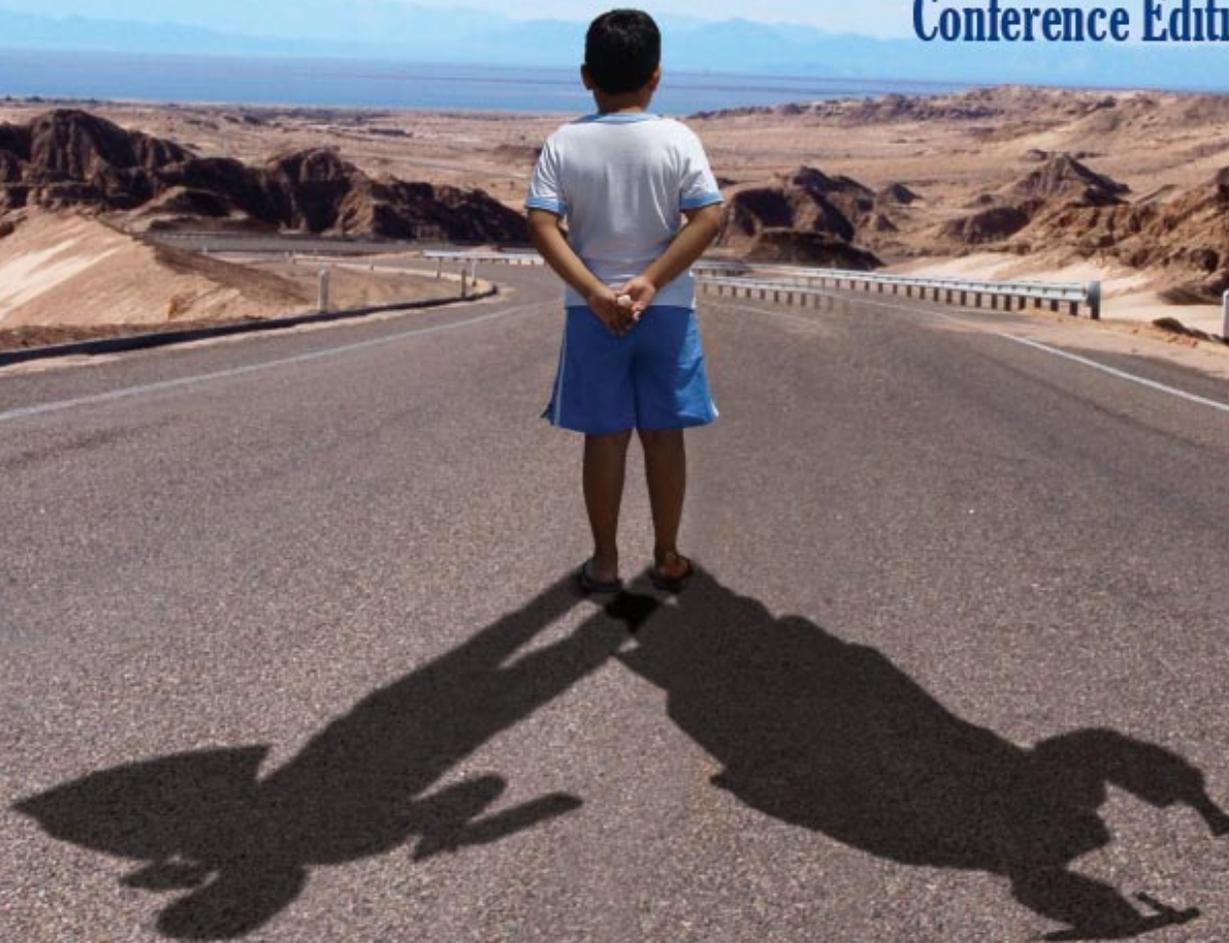


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Do Our Children Have A Chance?

The 2010 Human Opportunity Report for Latin America and the Caribbean

Conference Edition



José R. Molinas, Ricardo Paes de Barros, Jaime Saavedra, Marcelo Giugale

With Louise J. Cord, Carola Pessino, Amer Hasan

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Overview



Do Our Children Have A Chance?

The 2010 Human Opportunity Report for Latin America and the Caribbean

Overview

Imagine a country where your future did not depend on where you come from, how much your family earns, what color your skin is, or whether you are male or female. Imagine if personal circumstances, those over which you have no control or responsibility, were irrelevant to your opportunities, and to your children's opportunities. And imagine now a statistical tool that can help governments make that a reality. Welcome to the Human Opportunity Index (HOI).

The HOI calculates how personal circumstances (like birthplace, wealth, race or gender) impact a child's probability of accessing the services that are necessary to succeed in life, like timely education, running water or connection to electricity. It was first published in 2008, applied to Latin America and the Caribbean (LAC). The findings were eye-opening: behind the enormous inequality that characterizes the region's distribution of development outcomes (income, land ownership and educational attainment, among others), there is an even more worrying inequality of development opportunities. It is not only rewards that are unequal; it is also chances. The problem is not just about equality; it is about equity too. The playing field is uneven from the start.

This book reports on the status and evolution of human opportunity in LAC. It builds on the 2008 publication in several directions. First, it uses newly-available data to expand the set of opportunities and personal circumstances under analysis. The

data is representative of some 200 million children living in 19 countries over the last 15 years. Second, it compares human opportunity in LAC with that of developed countries, among them the US and France, two very different models of social policy. This allows for illuminating exercises in benchmarking and extrapolation. And third, it looks at human opportunity within countries—across regions, states and cities. This gives us a preliminary glimpse at the geographic dimension of equity, and at the role that different federal structures play.

The overall message that emerges is one of cautious hope. LAC is making progress in opening the doors of development to all. But it still has a long way to go. At the current pace, it would take, on average, a generation for the region to achieve universal access to just the basic services that make for human opportunity. Seen from the viewpoint of equity, even our most successful nations lag far behind the developed world. And intra-county regional disparities are large, and barely converging. Fortunately, there is much policy makers can do about it.

How Does the HOI Work?

In its simplest interpretation, the HOI measures the availability of services that are necessary to progress in life (say, running water), discounted or “penalized” by how unfairly the services are distributed among the population. So, two countries that have identical coverage may have a different HOI if the citizens that lack the service are all female, or black, or poor, or have many siblings or, more generally, share a personal circumstance beyond their control. In other words, the HOI is coverage corrected for equity. In theory, you can increase it by changing people’s circumstances (the “composition effect”), providing more services to all (“scale effect”), or distributing services more fairly (“equalization effect”).

The HOI runs from zero to 100; a society that has achieved universal coverage of all services would score at 100. To make comparisons possible across countries and across time, the HOI for LAC presented in this report uses only services and circumstances that are available in all household surveys. Specifically, it looks at access to water, electricity and sanitation, and to school attendance and timely completion of the sixth grade. A rich empirical literature demonstrates that, without those basic services, the chances of a productive life are close to nil. And it focuses on seven personal circumstances: parents' education, family income, number of siblings, the presence of both parents in the house, gender, gender of household head, and location of residence. In all cases, the unit of focus is the child, defined as an individual between the ages of zero and 16. This isolates away the problem of effort and choice—at that age, children can hardly be responsible for their fate.

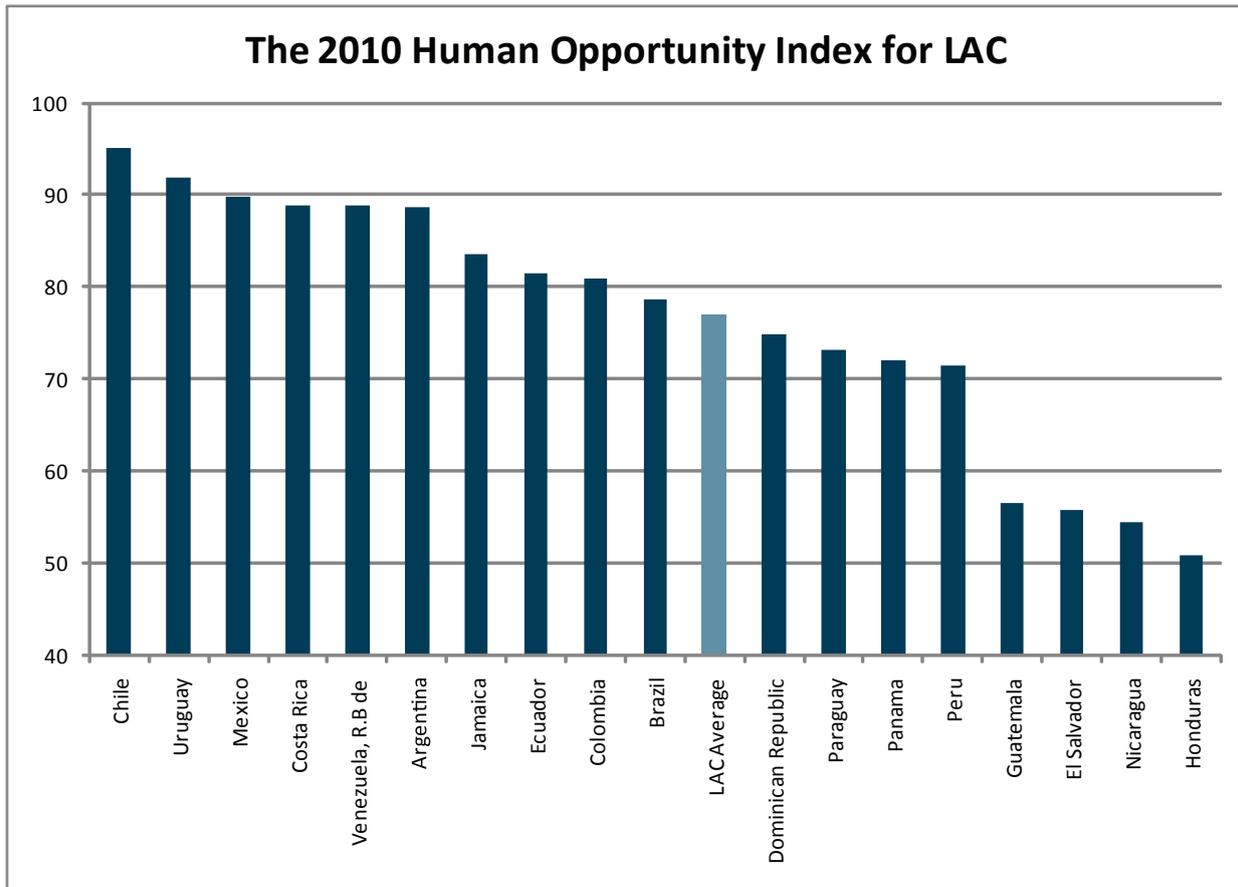
Of course, in country specific applications of the HOI, data availability may allow for more, or more sophisticated, services and circumstances, like preventive dental check-ups, internet access, ethnic identification, or father's occupation. Some of that will be shown here, when comparing LAC countries with their developed-world peers.

Is Human Opportunity Expanding in LAC?

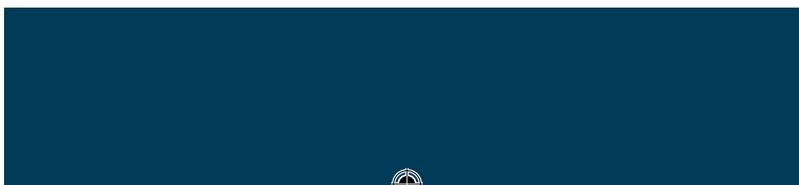
Yes, but slowly and with marked differences across countries. Since 1995, the region's average HOI has grown at a rate of one percentage point per year. This is clearly insufficient. For example, at its current speed, Central America would take 37 years to achieve universality in basic education and housing.

The good news is that all countries have raised their HOI in the last decade and a half, some quite rapidly (the fastest improvement occurred in Mexico). Variations remain wide though, from top-performer Chile (HOI of 95) to Honduras (51). Interestingly, the five countries with the highest HOI—Chile, Uruguay, Mexico, Costa Rica, and Venezuela—have very different development models.

Figure 1. The 2010 Human Opportunity Index for LAC



Source: World Bank 2010 Human Opportunity Report



Some countries excel at certain services and not at others. For example, Jamaica has the highest educational HOI, but is only mid-table in housing. Even within type of service, issues of quality arise: LAC children have more chances to be enrolled in school than to complete sixth grade on time. Attendance, it seems, is no synonym for learning.

Sadly, personal circumstances still matter a lot for Latin American children. Your parents' level of education will very likely determine yours. And your birthplace is still the most powerful predictor of whether you will have access to basic infrastructure.

For all their efforts, LAC governments have, in general, not made much progress improving equity. Only a tenth of the average improvement in HOI is attributable to a fairer allocation of services, that is, to better social targeting of public expenditures. The bulk of the new opportunities opened to the region's children came from changing circumstances (for instance, migration may have reduced the proportion of rural population).

Latin America Versus Rich Countries

Using standardized test results from the OECD's Program for International Student Assessment, and the related demographic data, it is possible to construct a HOI that measures the educational opportunities faced by 15 year-old children around the world. In other words, it is possible to measure how important are those children's personal circumstances in determining their proficiency in reading, mathematics or science. This sheds an uncomfortable light on LAC. Even the countries with the highest score in the region, Chile and Uruguay, rank well below the worst-performing countries in Europe and North America. Much of the gap is not due to the fact that rich countries just provide more education services, but to the relatively unfair way in which those services are distributed in LAC. If you are a Latin

American student, the wealthier your family is, the better your test results.

A similar exercise can be performed for housing conditions using census data. Again, LAC has work to do: the opportunity of living in a house with sanitation facilities or free from overcrowding is highly dependent on personal circumstances. In both conditions, only a handful of countries in the region score above the European average. And again, this is due less to larger coverage in Europe than to unfair provision in LAC.

Finally, international comparison allows us to peek at how human opportunity could evolve in LAC over the long term. Using a half-century's worth of relevant data for the US and France, an HOI for housing conditions can be built. It shows a clear pattern: rapid initial growth, followed by a marked slow-down, and virtually stalling right before the point of universal coverage. The lesson is clear: the better you do, the harder it is to make progress.

Country, State, City

How is human opportunity distributed at the sub-national level? There is enough information to replicate the HOI for some 165 states and cities in LAC, over the past 15 years. The results are telling. First, dispersion is wide among sub-nationals, with Tierra del Fuego at one end (HOI of 96) and the Atlantic region of Nicaragua at the other (29). Second, all capital cities rank higher than the rest of their countries, and that gap is wider the lower the level of the national HOI.

Third, convergence appears slow, but lagging geographic areas do improve faster and catch up in providing more opportunities to their local population—a mirror image of the observed evolution of human opportunity among countries. Fourth, the bigger or the less decentralized a country is, the more dispersed

its regions' HOI appear. And fifth, decentralization seems to have been more effective in diminishing regional inequity, but more so in education than in housing.

What Can Be Done?

LAC remains the most unequal region in the world. The result has been acrimonious political disagreement over the proper role of the state: should it redistribute wealth or protect private property? Where there is no disagreement, however, is over the need to give all Latin Americans the same opportunities, as a matter of social justice or as a call to personal effort. While equality is controversial, equity enjoys support across the political spectrum.

While not discussed in the report, the HOI makes it possible to redirect social policy towards equity (where there is consensus) and away from equality (where there is not). How? Many existing social policies and programs are already equity-enhancing. But focusing on equity reveals new points of emphasis along the individual's life-cycle. Early interventions, from pregnancy monitoring and institutional births to toddlers' nutrition and neurological development, get a new sense of priority. So do preschool access (such as pre-kindergarten social interaction) and primary school achievement (such as reading standards and critical thinking). The physical security, reproductive education, mentoring, and talent screening in adolescents, all areas that are often overlooked, gain new relevance. A battery of legal and institutional pre-conditions become sine qua non, from birth certificates, voter registration and property titles to the enforcement of anti-discrimination, antitrust, and access-to-information laws. And blanket subsidies that, at the margin, are consumed by those who do not need them (free public college education for the rich, to name one), turn into opportunity-wasting aberrations. If anything else, the quest for equity will lead to a final push in the decade-long process of targeting



subsidies, and will spell the end-game for a way of giving out public assistance that was blind to the needs of the recipient—a way that was intrinsically unfair.

At the same time, when applied within countries, the HOI is a powerful tool to identify and address regional inequities. Shouldn't a child-citizen have the same chances in life no matter where in the national territory she is born? Several LAC governments have in recent years implemented mechanisms to equalize service provision across sub-national jurisdictions. Most of those mechanisms are based on regional factors such as poverty levels, efforts at self-taxation, and ownership of natural resources. The question now is whether equal opportunity among children should not be taken into account too.





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Síntesis



¿Qué Oportunidades Tienen Nuestros Hijos?

Informe sobre la Oportunidad Humana en América Latina y el Caribe 2010

Síntesis

Imagínese un país donde su futuro no dependiera de cuánto ganan sus padres, ni del color de su piel, ni de si Usted es hombre o mujer, ni de dónde nació. Imagínese que sus circunstancias personales, aquellas sobre las que Usted no tiene control ni responsabilidad, fueran irrelevantes para sus oportunidades, y para las de sus hijos. Imagínese ahora una herramienta estadística que ayudara a los gobiernos hacer todo esto realidad. Bienvenido al Índice de Oportunidades Humanas (IOH).

El IOH refleja qué tanto las circunstancias personales (como el lugar de nacimiento, la riqueza familiar, la raza o el género) impactan la probabilidad de que un niño acceda a los servicios necesarios para ser exitoso en la vida, tales como educación oportuna, el agua potable o la conexión eléctrica. El índice se lanzó en el 2008, y su primera aplicación fue sobre los países de América Latina y el Caribe (ALC). Los resultados en ése momento fueron sorprendentes: detrás de la desigualdad que ha por siempre caracterizado la distribución de los resultados del desarrollo en la región (ingreso, acceso a tierra, logros educativos, entre otros), existe una desigualdad aún más preocupante en la distribución de las oportunidades que los niños tienen para desarrollarse. No sólo los logros son desiguales; también lo son las posibilidades de éxito. El problema no es sólo de igualdad; sino también de equidad. El terreno de juego está desnivelado desde el principio.

Este libro reporta sobre el estado y la evolución de las Oportunidades Humanas en ALC. Construye sobre el informe del 2008 en varias direcciones. En primer lugar, expande el conjunto

de oportunidades y de circunstancias personales al beneficiarse de información estadística recientemente disponible. Los datos son representativos de más de 200 millones de niños y niñas en 19 países durante los últimos 15 años. En segundo lugar, compara las Oportunidades Humanas en ALC con las de países desarrollados, entre ellos Estados Unidos y Francia, dos modelos de política social marcadamente diferentes. Esto permite hacer interesantes paralelismos, así como extrapolaciones de tendencias futuras. Y tercero, se evalúan las Oportunidades Humanas dentro de cada país, analizando regiones, estados y ciudades. Esto nos da una radiografía preliminar de la dimensión geográfica de la equidad, y del rol que juegan las diversas estructuras federativas.

El mensaje general que surge del análisis es uno de cauta esperanza. América Latina y el Caribe han avanzado en abrirles a todos la puerta al desarrollo. Pero todavía tienen mucho camino por recorrer. Al ritmo actual tomará, en promedio, una generación para que la región logre universalizar los servicios básicos que se requieren para realizarse en la vida. Desde la perspectiva de equidad, aún nuestros países más avanzados están muy lejos del mundo desarrollado. Las disparidades al interior de los países son también amplias, y apenas convergen. Por fortuna, es mucho lo que nuestros gobiernos pueden hacer.

¿Cómo funciona el IOH?

En su interpretación más simple, el IOH mide la tasa de disponibilidad de los servicios que son necesarios para progresar en la vida (como por ejemplo, el agua potable), descontando o “penalizando” la tasa por cuán injusta es la distribución de esos servicios entre la población. Así, dos países que tienen la misma cobertura pueden tener distintos IOH si los ciudadanos que no tienen el servicio son todas mujeres, o todos indígenas, o todos tienen un alto número de hermanos o, en términos generales, comparten una circunstancia personal que no esté bajo su control. En otras palabras, el IOH es la cobertura corregida por la equidad. En teoría, el índice puede aumentar cambiando las circunstancias de las personas (efecto de composición), aumentando el servicio a todos (efecto de escala), o distribuyendo el servicio de una forma más justa (efecto de equidad).

El IOH va de cero a 100; una sociedad que ha alcanzado cobertura universal de todos los servicios básicos tiene un puntaje de 100. Para poder hacer comparaciones a través de países y a través del tiempo, el IOH que se presenta para la región en este informe incluye solo los servicios y circunstancias disponibles en todas las encuestas de hogares. Específicamente, se observa el acceso a agua, electricidad y saneamiento, la asistencia escolar y la terminación a tiempo del sexto grado educativo. La literatura empírica demuestra de manera contundente que sin acceso a estos servicios básicos, las posibilidades de llevar una vida productiva son casi inexistentes. Al mismo tiempo, este informe se concentra en siete circunstancias personales: educación de los padres, ingreso familiar, número de hermanos, género del niño, presencia de los padres, género del jefe de hogar, y lugar de residencia. En todos los casos, la unidad de análisis es el niño, definido como un individuo entre 0 y 16 años. Esto permite aislar dudas sobre decisiones y esfuerzo personal—a esa edad, un niño difícilmente pueda considerarse responsable por su destino.

Por supuesto que cuando se aplica el IOH a un país específico, la disponibilidad de datos permite incluir un grupo de servicios y circunstancias más amplio, o más sofisticado, como chequeos dentales preventivos, acceso a internet, identificación étnica y ocupación del padre. Esto se ve en el informe, cuando se compara la región con países más desarrollados.

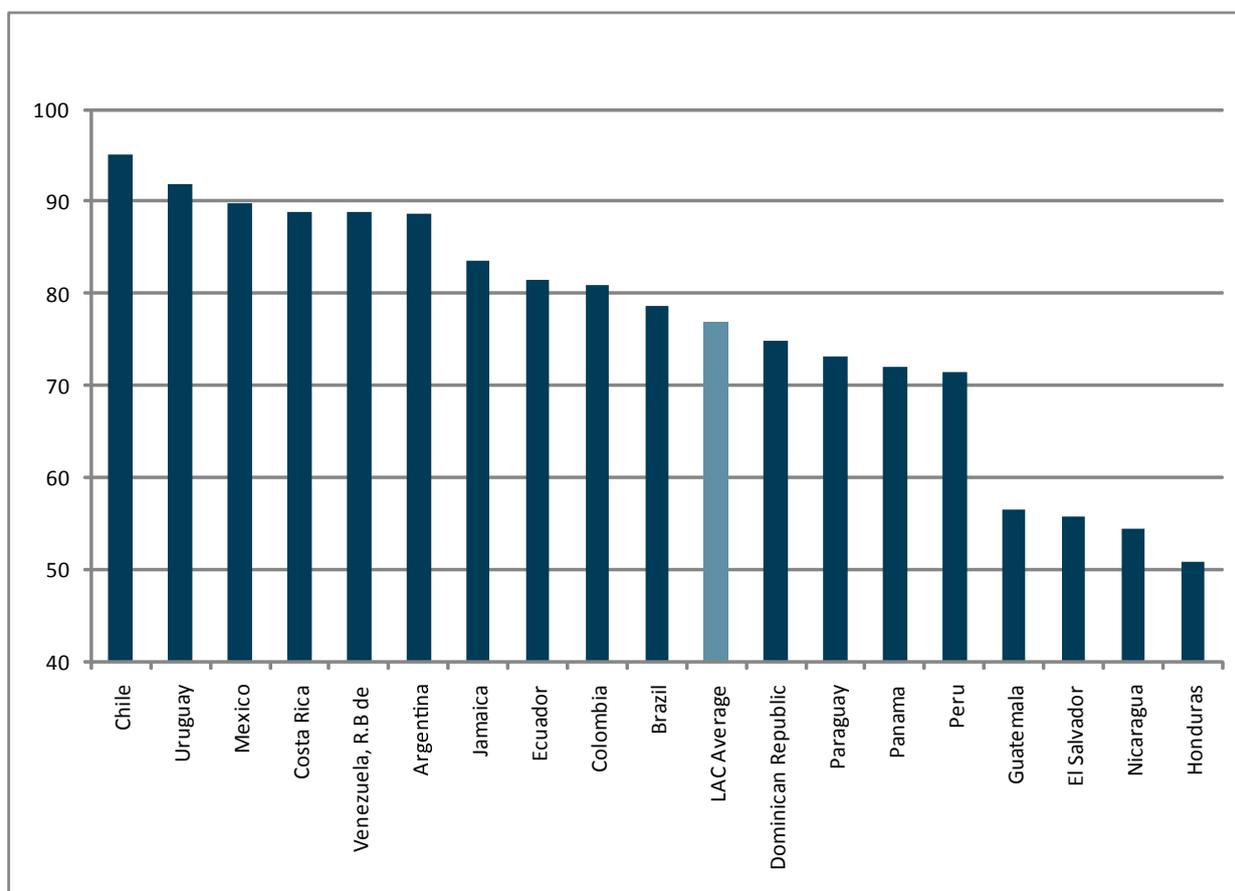
¿Ha mejorado el nivel de oportunidad humana en ALC?

Sí, pero con lentas y con marcadas diferencias entre países. Desde 1995, el promedio del IOH regional ha crecido a una tasa de un (1) punto porcentual al año. Esto es claramente insuficiente. A este ritmo por ejemplo, a los países de Centro América les tomará 37 años lograr la universalización de servicios básicos en educación y vivienda.

La buena noticia es que todos los países de ALC aumentaron su IOH en los últimos 15 años, algunos bastante rápido (el mejoramiento más acelerado ocurrió en México). Hay mucha variación entre países:

desde Chile, con el mejor desempeño (IOH de 95) a Honduras (51). Resulta interesante que los 5 países con el IOH más alto (Chile, Uruguay, México, Costa Rica, y Venezuela) tienen modelos de desarrollo muy diferentes.

Figura 1. El Índice de Oportunidades Humanas para ALC 2010



Fuente: Banco Mundial Informe Oportunidad Humana 2010

A algunos países les va muy bien en unos servicios pero no en otros; Jamaica por ejemplo, tiene el IOH más alto en educación pero está en una posición promedio en vivienda. Dentro de un determinado servicio, pueden verse temas de calidad: los niños de ALC tienen más posibilidad de estar matriculados en una escuela que de terminar el sexto grado a tiempo. Al parecer, la asistencia no garantiza el aprendizaje.

Tristemente, las circunstancias personales todavía importan mucho para los niños de América Latina. El nivel de educación de sus padres muy probablemente determinará el suyo. El lugar donde Usted nació sigue siendo el principal predictor de su acceso a infraestructura básica.

A pesar de sus esfuerzos durante la última década, los gobiernos de ALC, en general, no han logrado mejorar significativamente la equidad. Sólo una décima parte del avance promedio del IOH en la región se puede atribuir a una asignación más justa de los servicios, esto es, está relacionado a mejoras en los sistemas de focalización del gasto público social. La gran mayoría de las nuevas oportunidades han surgido principalmente gracias a cambios en las circunstancias personales (por ejemplo, la migración ha reducido la proporción de población rural).

América Latina y los países desarrollados

Utilizando los resultados de las pruebas estandarizadas del Programa Internacional de Evaluación del Estudiante de la OECD (PISA, por sus siglas en inglés), y la información demográfica relevante, se puede construir un IOH educativo para los niños y niñas de 15 años en el mundo. En otras palabras, se puede medir qué tan importante son las circunstancias personales de esos niños en sus habilidades de lectura, matemáticas y ciencia. Esta comparación ilumina una verdad incómoda para ALC. Aún los países con mejores puntajes, Chile y Uruguay, se encuentran muy por debajo de los países con los peores puntajes en Europa y en América del Norte. Esta brecha no se debe únicamente a que los países avanzados proveen

más servicios educativos, sino también a la forma relativamente injusta en que se distribuyen estos servicios en ALC. En el contexto latinoamericano, cuanta más rica sea la familia, mejores resultados en las pruebas de sus hijos.

Un ejercicio similar se puede realizar para los servicios de vivienda, utilizando datos censales. Aquí también ALC tiene mucho por hacer: la oportunidad de vivir en una casa con servicios sanitarios, o libre de hacinamiento, es altamente dependiente de las circunstancias personales. En ambas condiciones sólo un grupo muy reducido de países de ALC logra un puntaje por encima del promedio europeo. De nuevo, esto se debe más a la injusta distribución en ALC que a una mayor cobertura en Europa.

Finalmente, las comparaciones internacionales nos permiten analizar cómo podría ser la evolución de las oportunidades en ALC en el largo plazo. Utilizando datos de casi medio siglo para Estados Unidos y Francia, se puede construir un IOH para servicios de vivienda. Se observa un patrón claro: crecimiento rápido al inicio, seguido de una marcada desaceleración, y un virtual detenimiento justo antes del punto de cobertura universal. La lección es clara: cuánto más equitativo ya se es (más alto el IOH), más difícil es progresar. A la inversa, los países que hoy se encuentran más atrasados, son los que más rápido pueden avanzar.

País, Estado, Ciudad

¿Cómo está distribuida la oportunidad humana a nivel sub-nacional? Existe suficiente información para replicar el IOH en 165 estados y ciudades de ALC, en los últimos 15 años. Los resultados hablan por sí mismos. Primero, la dispersión entre regiones es amplia: desde Tierra del Fuego con un índice de 96 en un extremo, a la costa Atlántica de Nicaragua con un puntaje de 29 en el otro. Segundo, todas las capitales tienen mejores puntajes que el resto de sus respectivos países; la diferencia es aún más grande cuanto más bajo sea el nivel del IOH a nivel nacional.

Tercero, hay signos de convergencia, pero es lenta. Las regiones que están más atrasadas tienden a mejorar más rápido y a ponerse al día en términos de proveer oportunidades a sus poblaciones—un espejo de la evolución que se observa al comparar la evolución de la oportunidad humana entre países. Cuarto, entre más grande sea el país o cuanto menos descentralizado esté, mayor la dispersión del IOH entre sus regiones. Y quinto, el proceso de descentralización parece haber sido efectivo para disminuir la inequidad regional, pero más en educación que en vivienda.

¿Qué se puede hacer?

ALC sigue siendo la región más desigual del mundo. Esto ha resultado en un agrio e inconcluso debate sobre el rol del Estado: ¿debe redistribuir riqueza o debe proteger la propiedad privada? En lo que no existe desacuerdo es en la necesidad de proveer a todos los latinoamericanos las mismas oportunidades, como una cuestión de justicia social, o como un llamado al esfuerzo personal. Mientras que la igualdad es controversial, la equidad cuenta con apoyo unánime a lo largo del espectro político.

Aunque no es materia directa de este informe, el IOH hace posible re-dirigir la política social hacia la equidad (donde hay consenso) y no tanto hacia la igualdad (donde no lo hay). Pero, ¿cómo? Muchas de las políticas y programas sociales ya existentes aumentan la equidad. No obstante, cuando el objetivo es la equidad, se iluminan nuevas áreas de énfasis para la acción pública en cada momento del ciclo de vida del individuo. Intervenciones tempranas, como el monitoreo al embarazo, nacimientos asistidos profesionalmente, nutrición infantil y desarrollo neurológico, toman un nuevo carácter prioritario. Lo mismo pasa con el acceso a educación pre-escolar (interacción social temprana) y con los logros de los estudiantes de escuela primaria (como estándares de lectura y de pensamiento crítico). Áreas que suelen descuidarse en los adolescentes, como la seguridad física, la educación reproductiva, los programas de mentores y la identificación de talentos, retoman nueva relevancia. Una batería de servicios legales e institucionales se

convierte en requisito sine qua non para los adultos desde los registros de nacimiento e identificación, tarjetas de votante, y títulos de propiedad, hasta el cumplimiento de leyes contra la discriminación y el monopolio y de acceso a la información.

La lucha por equidad puede también convertirse en el último empuje al proceso de mejoramiento en la focalización de los subsidios, un proceso que ya lleva más de una década en la región. Dicho de otro modo, permitiría eliminar subsidios que, en el margen, son consumidos por quienes no los necesitan (educación universitaria pública para los ricos, por nombrar uno). Se terminaría así para siempre con la vieja práctica latinoamericana de dar asistencia sin tener en cuenta si el beneficiario la necesita o no—un método intrínsecamente injusto.

Al mismo tiempo, cuando se miden las oportunidades dentro de los países, el IOH resulta un instrumento poderoso para identificar inequidades entre regiones/ciudades/estados. ¿No deberían todos los niños de un mismo país, como ciudadanos, tener las mismas posibilidades de éxito en la vida sin importar en que esquina del territorio nacional nacieron? Muchos países de ALC han puesto en marcha mecanismos para igualar la provisión de servicios a través de las jurisdicciones sub-nacionales. Estos mecanismos están basados en factores locales como el nivel de pobreza, el esfuerzo tributario propio, y/o la presencia de recursos naturales. La pregunta ahora es si la igualdad de oportunidades entre los niños no debería también ser un factor para tener en cuenta.



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Chapter



1

How Far Are We From Ensuring Opportunities for All? The Human Opportunity Index

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How Far Are We From Ensuring Opportunities for All? The Human Opportunity Index

Universal access to key goods and services such as clean water, basic education, health services, minimum nutrition and citizenship rights is a crucial step towards justice and fairness. Expanding access to these goods and services has long been a central issue in the analysis of economic development and in public policy discussions, including the Millennium Development Goals initiative. The chance people have to pursue the life of their choosing involves the opportunity to access key goods and services, which constitute human capital investments that expand each individual's abilities and options. The goal of providing universal access to key goods and services is often included in national development plans, national constitutions, and international agreements such as the Universal Declaration of Human Rights. This chapter presents a method to measure a society's progress as it moves toward attaining universal access.

At first glance, one might think that simply measuring coverage rates suffices. But this has a fundamental shortcoming. As a country develops, the opportunity to access key goods and services is only partial; they are scarce and can be allocated in many different ways. The allocation of goods and services within the population is

never random, and in many cases is not egalitarian. An equitable development process should seek to ensure that the opportunity for children to access these key goods and services is not correlated with circumstances that are beyond their control, such as gender, parental background or ethnicity. The Human Opportunity Index (HOI), first presented by Barros et al. (2009), combines both coverage rates and equity in a single measure. The HOI considers a) how far a country is from the goal of providing universal access to a set of goods and services to all, and b) the degree to which each child in the country has an equal opportunity to access those good and services.

Equality of opportunity requires that access to key goods and services not be related to variables we call circumstances. Circumstances are personal, family or community characteristics that a child has no control over, and that, for ethical reasons, society wants to be completely unrelated to a child's access to basic opportunities. For instance, most societies would agree that opportunities should not be assigned based on gender, ethnicity, nationality, parental background or religion. Instead, opportunities should be allocated non-systematically and not be detrimental

to any particular social group. The HOI measures the coverage rate, and then adjusts it according to how equitably goods and services have been allocated among circumstance groups.

This chapter discusses what characterizes basic goods and services, and the implications of allocating them equitably. We also present the conceptual underpinnings of the HOI. It is a synthetic measure of how far a society is from universal access to a good or service, and how equitably access is distributed across circumstance groups. We briefly outline the HOI's properties, and present decompositions illustrating how progress can be made by expanding average coverage and/or more equitably distributing opportunities of access. Lastly, we outline a methodology to operationalize these concepts in 19 Latin American and Caribbean countries to assess progress during the last decade in universalizing basic opportunities for children. The empirical results are presented in the following chapter.

1.1. Key Concepts: Basic Goods and Services, Universality, Equality of Opportunity and Circumstances

Having opportunities means that people can pursue the life of their choosing. A critical aspect of this is having access to key goods and services that are fundamentally important for a person to lead a dignified life in modern society. Access gives a person the opportunity to

advance, although they may or may not ultimately achieve this advancement. In some cases, having access to one specific good or service is not enough. For example, the opportunity to learn requires a bundle of goods and services—access to a good school might not be enough; a child also needs adequate nutrition to have the opportunity to learn.

The HOI focuses on goods and services that constitute investments by people in themselves—those that improve a person's ability to expand her future production possibility frontier. These investments have a major impact on what a person can be or do, affecting both market and non-market outcomes. In this broad sense, investing in these goods and services increases one's human capital.

Our attention is limited to private goods and services that expand people's chances of living a better life. They are private in the traditional economic sense of being excludable. As long as the provision of these goods and services entails a cost and there are finite resources (i.e., a budget constraint), allocative decisions are required. Given the paramount importance of allocative decisions to economic and social policy, this study focuses precisely on access to goods or services that expand chances, and not on other dimensions of policy that might also play that role.¹

Basic goods and services and universality

Societies may decide that the universal access to selected goods and services should be a major social goal. Goals of this sort are often elucidated in national development plans and sometimes national constitutions, and are also laid out in the Universal Declaration of Human Rights. Whenever a national consensus exists that some goods and services should be enjoyed by everyone, we refer to them as basic. Even though the set of basic goods and services may vary with the socioeconomic and cultural context, the top priorities seem to be quite similar among all societies. To be considered basic, goods and services also need to be affordable—otherwise universal access would not be economically feasible.

A societal goal of universal access does not necessarily imply either how universality is to be accomplished or who is responsible. Even if universal access to a basic good or service is defined as a social right, it does not automatically mean that the public sector is responsible for provision or financing. In the extreme, a society may set a goal of universal access even when the responsibility is entirely individual,

not collective. For instance, to set a goal of universal access to adequate nutrition does not necessarily imply that everyone is entitled to receive a monthly food basket from the government. Societies may use multiple mechanisms in order to achieve universality. Universal access to primary education may be ensured through a system of free public schools, through a privately-managed but publicly-funded system, through a public school system that recovers costs from wealthier families only, or through private schools with partial or full scholarships depending on family resources.

Assessing progress towards opportunity for all: limitation of the coverage rate as a measure

If universal access to basic goods and services is to be considered a major development goal, then it is critical to develop adequate measures of the progress towards its accomplishment. Traditionally, the coverage rate—the proportion of the population with access to a given opportunity—has been used to measure progress. It certainly seems natural to measure progress by the distance of the coverage rate to its ideal 100 percent. However, measures of

¹ It should be noted that increasing opportunities sometimes does not require access to goods and services. For instance, to the extent that international migration represents a chance for progress, the right to migrate may be an opportunity in itself. Migration may have private costs, but if they are substantially outweighed by the benefits, it will be the lack of rights that will deter migration and consequent advancement. Many civil rights represent chances to progress and hence opportunities, without necessarily being associated with the access to any key goods or services. We do not dwell here on these types of opportunities.

progress should be sensitive to allocation. When there are sufficient resources to provide something to everybody, there will be no allocation dilemma. However, when available resources only allow for providing key goods and services to some, the decision of who enjoys access depends on allocation. In this situation, measures of progress towards the ideal of opportunity for all should privilege egalitarian allocation.

Consider, for instance, two societies (I and II) made of two ethnic groups (A and B) of equal population size. Suppose that at the current time, there are enough resources to give access to a specific service only to half of the population. Hence, in both societies the average coverage rate is 50 percent. Suppose, however, that in Society I the service is allocated to the ethnic group A and none to group B—the coverage rates are 100 percent for group A and 0 percent for group B. On the other hand, in Society II both ethnic groups equally share the limited available services, and as a consequence the coverage rate is 50 percent in both groups. Hence, even though both societies have the same average coverage rate, they differ remarkably in the allocation of their scarce services. In principle, the allocation rules of Society II are more egalitarian. As a consequence, any valid measure ought to indicate that Society II is closer than Society I to the ideal of equitably allocating goods and services, even if the total coverage rate in both

is only 50 percent. A single aggregated coverage rate is not enough to track progress toward the ideal of opportunity to all since it is insensitive to the fairness of allocation.

Equality of opportunity, circumstances and incidence analysis

This report, in the tradition of the World Development Report 2006 “Equity and Development” and of Barros et al (2009), adopts a notion of fairness that is related to equality of opportunities. To the extent that basic goods and service are scarce and indivisible, some people will have access to them and others will not. According to the principle of equality of opportunity, everybody should have the same chance of accessing them, regardless of their circumstances. In the example of two societies presented above, incidence analysis—which breaks down coverage by different socioeconomic and demographic groups—uncover differences in coverage rates for each ethnic group. For equality of opportunity to prevail, all group-specific coverage rates must be the same.

Circumstances, as used here, are personal, family or community characteristics over which an individual has no direct control. For ethical reasons, society wants these to be completely unrelated (directly or indirectly) to one’s access to basic opportunities. Boys and girls should all have the same opportunities to access good quality education and adequate

nutrition, irrespective of the education of their parents, their ethnicity or their place of birth. That is, when basic opportunities are limited, they should be allocated non-systematically and in a way not detrimental to any particular group.

The ethical ideal of equal opportunity is intimately related to equal treatment, lack of discrimination, citizenship and personal development independent of socioeconomic origin. What exactly determines which characteristics are considered a circumstance is more complex. One either provides an exhaustive list of all circumstances, or a general rule for identifying whether a characteristic is a circumstance or not. Any set of circumstances as used here is subjective or at least relative. Ultimately, each society chooses their own set of circumstances that it believes should not interfere with access to basic goods and services.

In some cases, circumstances may have a role as policy instruments in the provision of goods and services, because they are an efficient mechanism for expanding access. For example, despite the fact that a child should have access to basic nutrition regardless of their parent's income, social policy analysis might consider family income a valid instrument

for children to obtain access to basic nutrition support programs. Thus, even though society ideally prefers that family income not be related to children's access to basic food, it may use income transfers as an instrument to reduce malnutrition on a transitional basis. Similarly, in the long run societies want all children to have access to adequate nutrition and health care independent of their mothers' education. However, since a mother's education has a critical role in providing more opportunities to get adequate nutrition and health care, social policies are in many cases designed to strengthen this externality.²

Incidence analysis is an improvement over a single aggregated coverage rate for measuring progress towards leveling the playing field, since it can be sensitive to inequality of opportunity. Incidence analysis substitutes one coverage rate with many—one for each circumstance group. In the spirit of incidence analysis, one could say that for equality of opportunity to prevail, all group-specific coverage rates must be the same. Incidence analysis, however, is not enough to measure progress towards opportunity for all, since it does not provide a synthetic scalar measure of how far a society is from both equality of opportunity and universal coverage. To

² Can changing the distribution of circumstances be a valid policy? In the case of circumstances like gender, religion, ethnicity or nationality, society has no interest in changing their distribution to reach universal coverage. But society may, for example want to eliminate the influence of parental income on a child's education, to reduce the intergenerational transmission of poverty. One strategy to do that is through educational policies. But another could be to implement policies to reduce income inequality. A problem of this strategy is that equalizing opportunities through reducing inequalities in the distribution of circumstances is often impractical or might take too long.

track hundreds of coverage rates would be too cumbersome to be useful to both policymakers and other key stakeholders in society.³

The scalar measure of equal opportunity progress towards universal access to access basic goods and services, first presented in Barros et al (2009), takes into consideration both (a) average coverage and (b) if available goods or services are allocated equitably. A scalar measure of progress towards universality that combines these two features can be called an equality of opportunity-sensitive coverage rate.

Access, utilization, quality and outcomes

When measuring the access to specific goods and services, one must be very careful in defining what access means. Does access to schooling mean having a school nearby? Or having a good school nearby? Or attending school? Or having all the conditions needed to have a productive educational experience? Or achieving learning outcomes? One could easily imagine a situation in which a school or a health clinic exists in a community, but few actually take advantage of it. To the extent that opportunity is just the chance of accessing key goods and services for

children, there is a strong argument for universal coverage and defining equality of opportunity in terms of access and use. For this study, we assume that as long as the focus of analysis is children, then access and utilization should be considered the same. A child may have access to a school reasonably close to her home, but may not attend school because her parents do not value education or because the school is of very low quality. In this case, we treat the child as having no access to school. If this is a basic service, society must ensure that the child uses the service, which might entail not only having a school nearby, but also maintaining schools at a level of quality sufficient to convince parents that it pays to send their children to school, educating parents on the benefits (economic and otherwise) of education, or enforcing attendance. Hence, we consider that coverage should be measured as a student enrolling and attending a formal school. Another consideration is quality. Basic goods and service are usually not homogeneous, and quality might vary tremendously. If, for example, clean water is a basic good or service, it is important to empirically assess what modes of provision provide a minimum threshold of quality.

An alternative view considers coverage

³ When consider even a small number of circumstances, the number of relevant circumstance groups in a particular society can be very large. For example, consider the case of a society with only six relevant circumstances: gender (male-female), race (white-black), location (urban-rural), parental education (less than primary-primary-secondary-tertiary), and per-capita family income (classified in quintiles). In this particular case, with only six circumstances and a very parsimonious breakdown of each, we will have 160 circumstance groups.

to extend only to those who benefit from the use and access of a basic good and service above a minimum threshold. It is effective access to services of quality that produce a minimum level of outcome. For instance, the best practical measure of effective access to quality education could be the proportion of children of a given age with learning proficiency above a minimum level. In this view, access is just a means to reach minimum levels of certain outcomes that ought to be compulsory.⁴ It would not be sufficient to ensure universal access to schools of quality and to guarantee that all families have the conditions they need to fully take advantage of this opportunity. We do not pursue this alternative view due to the lack of comparable outcome indicators for all countries, as discussed below.

1.2. Constructing a Measure of Progress Towards Basic Opportunities for All

In this section we introduce and evaluate the properties of the Human Opportunity Index (HOI), a synthetic scalar measure for monitoring both

(a) the average coverage of a good or service, and (b) if it is allocated according to an equality of opportunity principle.⁵ Such scalar measures are fundamental for measuring progress towards the universal provision of basic goods and services. Such a summary measure could also be essential for improving targeting of neglected groups and for improving the effectiveness of a social policy aimed at universal access to basic goods and services.

The literature provides many measures of equality of opportunity, such as those presented in Bourguignon et al. (2007), Checchi and Peragine (2005), Barros et al (2008), Lefranc et al (2006), among others. The main contribution of this study is not only measuring equality of opportunity, but also how to incorporate equality of opportunity concerns when evaluating coverage. As such, the HOI assesses the whole empirical distribution of the provision of opportunities to access a specific good or service. It encompasses both the average coverage rate of a basic good or service and a relative measure of equality of opportunity.

⁴ According to this line of reasoning, universal access to opportunities is just an instrument to ensure minimum outcomes for all. What should be evaluated is not the universal access in itself, but its consequence on ensuring minimum merit outcomes. Accordingly, whenever available the best option would be a direct measure of these outcomes (percentage of infants surviving, or the percentage of eight year-olds who are literate). Measures based on outcomes are to a large extent at odds with the notion of opportunity as just a chance to progress. In principle, equality of opportunity should not necessarily lead to equality of outcomes or even to a minimum basic outcome for all. However, some of these outcomes, like a minimum learning threshold, may be considered opportunities, as they proxy access to a minimum bundle of goods and services, that, according to current technology, can produce a minimum learning standard.

⁵ Strictly speaking, this implies that we will calculate a measure that consists of the average coverage rate of a basic good or service (say, access to water). This will be adjusted by the degree by which access to this service (water) is allocated according to a principle of equality of opportunity. So, in this second step we are concerned with the equality of opportunity of having access to water.

Constructing the Human Opportunity Index

Any equality of opportunity-sensitive coverage rate must take into account both the overall coverage and the differential coverage rates of the several circumstance groups that make the whole population. The construction of an equality-sensitive coverage rate amounts to aggregating circumstance-specific rates in a scalar measure that, at the same time, increases with overall coverage and decreases with the differences in coverage among circumstance groups. One could imagine a number of alternative ways of constructing an equality of opportunity-sensitive coverage rate having these two properties. The HOI is based on

discounting a penalty for inequality of opportunity, P , from the overall coverage rate, C , so that

$$\text{HOI} = C - P$$

The penalty is chosen such that it is zero if all circumstance group-specific coverage rates are equal and is positive and increasing as differences in coverage among circumstance groups increase. This penalty makes the HOI sensitive to equality as well as overall coverage. Intuitively, P is larger the larger the dispersion of group-specific coverage rates. Only when the penalty is zero and average coverage is universal does the HOI reach the maximum value of one (see Box 1 for computation details).

Box 1: Computing the Penalty for Inequality of Opportunity

Computing P requires identifying all circumstance groups with coverage rates below the average rate; we refer to them as the opportunity-vulnerable groups. For each opportunity-vulnerable group, k , \bar{M}_k is the number of people with access to a good or service needed for its coverage rate to equal the average rate, while M_k is the number of people in group k with access. $M_k - \bar{M}_k$ is then the opportunity gap for the vulnerable group k . The penalty is the sum of the opportunity gaps of all vulnerable groups (called the overall opportunity gap) divided by the total population (N):

$$P = \frac{1}{N} \sum_{k=1}^v (M_k - \bar{M}_k)$$

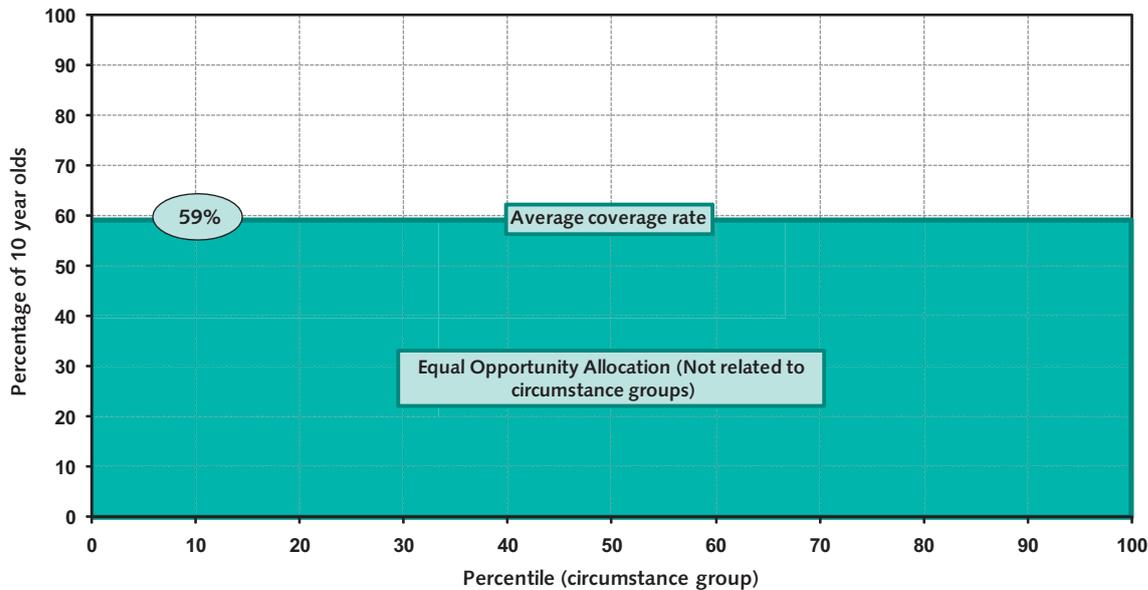
Intuitively, P can be interpreted as the percentage of people whose access would have to be reassigned to people of the groups with below-average coverage rates to achieve equality of opportunity. If all groups had exactly the same coverage rate, that penalty would be zero, and no reassignment would be needed. As coverage approaches universality for all groups, that reassignment becomes smaller.

Below we present a graphical explanation of the computation and interpretation of the HOI. The explanation uses data on access to safe water for 10 year-old children in a fictitious country (a detailed numerical example can be found in Annex 1). In the first example, the overall average coverage rate is 59 percent, and each circumstance group

specific coverage rate is also 59 percent, meaning this is a situation of equality of opportunity (Figure 1.1). The average coverage rate line represents the equal opportunity line. Even though access is not related to circumstances, the playing field is not level since 41 percent of the children do not have access to safe water while 59 percent do.

Figure 1.1

**Percentage of 10 year olds with Access to Safe Water
- Equal Opportunity Allocation -**



Source: Simulations for a fictitious country.

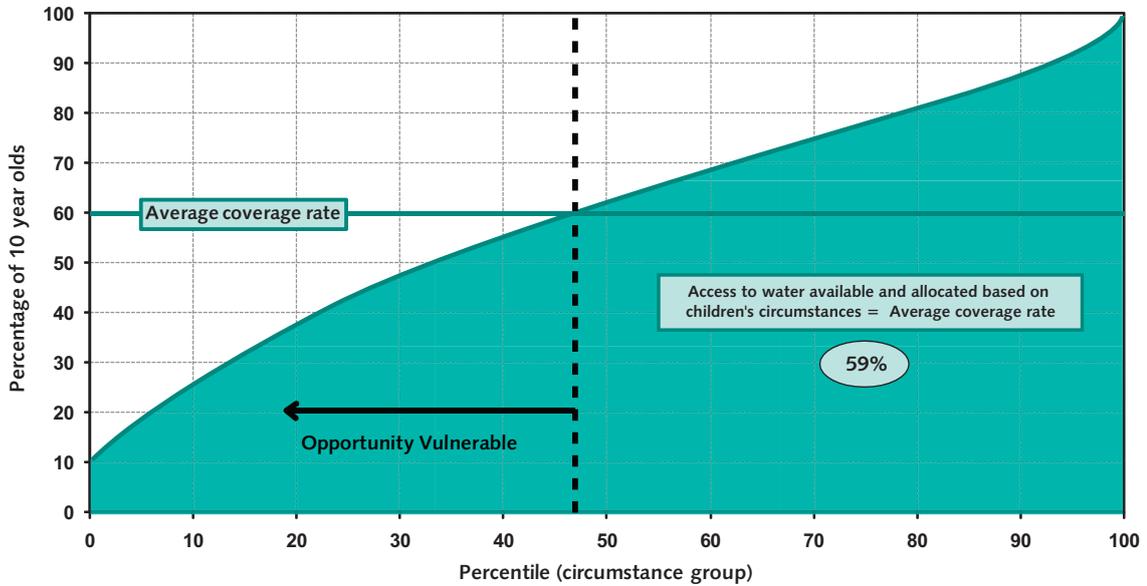
In the second situation, 59 percent of children still have access to safe water and 41 percent do not, but now the allocation is related to children's circumstances, and as such there is

no equality of opportunity (Figure 1.2).⁶ Those circumstance groups with coverage rates below the overall average rate are called "opportunity vulnerable" groups.

⁶ The horizontal axis depicts circumstance groups ordered according to the group-specific probability of access to water.

Figure 1.2

Percentage of 10 year olds with Access to Safe Water:
- Unequal Opportunity Allocation -



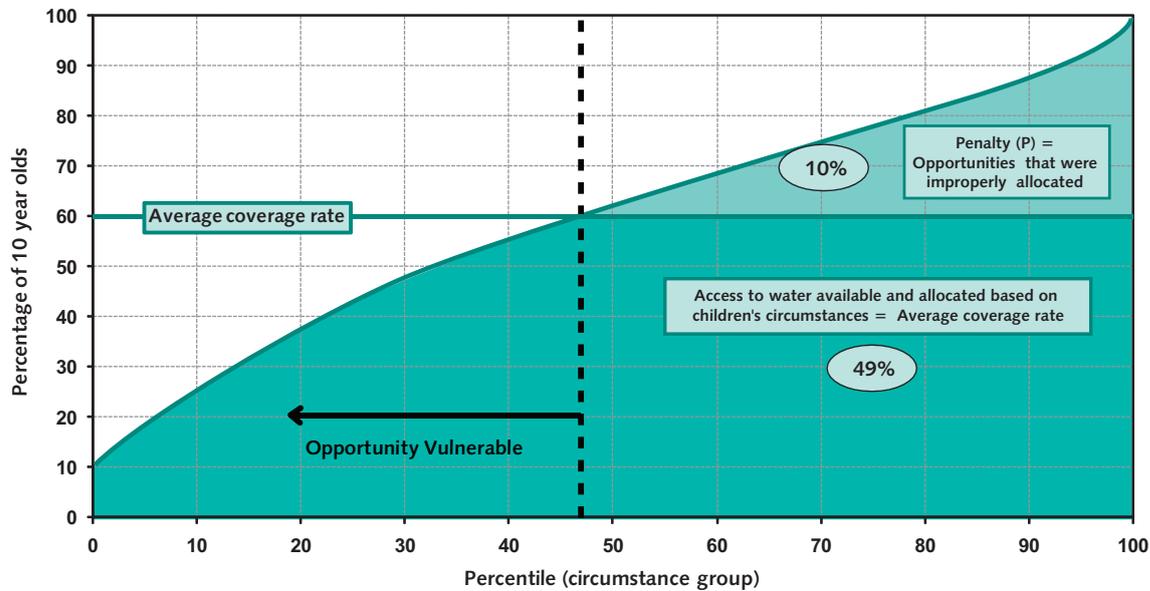
Source: Simulations for a fictitious country.

To calculate the HOI for the second situation, the penalty refers to access to safe water that was allocated in violation of the equal opportunity principle (Figure 1.3). Every allocation of access to water to circumstances groups above the overall average is a violation of the equality of opportunity principle, since access to safe water is not independent of circumstances. In this example, 10

percent of access to water was allocated inequitably. The HOI is equal to the average coverage rate (59 percent) minus the penalty for inequality of opportunity (10 percent): 49 percent. In other words, the HOI can be thought of as the weighted average of the circumstance group-specific coverage rates for all groups with below-average coverage.

Figure 1.3

Penalty for Inequality of Opportunity and the HOI Access to Safe Water



Source: Simulations for a fictitious country.

Properties

This section discusses three important properties of the HOI. First, it is defined as an equality-sensitive coverage rate. As such, its value falls as inequality in the allocation of a given fixed number of opportunities increases. In this case the opportunity gap may increase (it will never decrease), leading to a corresponding increase in the penalty. Second, this equality-sensitive measure is Pareto consistent. In principle, sensitivity to equality should never be so large that the index would decline when no one loses access but someone that previously had no access gains access. Even though

inequality may increase sharply, no coverage rate for any circumstance group would decline. Hence, there is no reason for the overall score to worsen. The HOI is indeed Pareto consistent. Whenever no one loses access and at least someone gains access, the index will always improve, regardless of whether that person belongs to an opportunity-vulnerable group or not.

Third, when the coverage rates of all circumstance groups increase proportionally, the HOI will increase by the same proportion. It can be easily established that in this case both the coverage and the penalty would also increase by the same percentage, as

would the index. In the case of an equal increase in percentage points for all group-specific coverage rates, the index would also increase by the same percentage points. In this case all differences in coverage rates and the penalty would remain unchanged, while the overall coverage—and hence the index—would increase by the same percentage points.

Thus, when (i) inequality declines and overall coverage remains constant, or (ii) overall coverage increases while inequality remains constant, the HOI will always improve. So it is in fact a valid inequality-sensitive coverage rate. Lastly, since the HOI is equal to the difference between the overall coverage rate and the penalty, it is always equal to or lower than the coverage rate. Since the coverage rate is lower than one (i.e., under 100 percent), so too is the index.

The HOI and the Dissimilarity Index

Using a penalty allows us to define an equality-sensitive coverage rate without actually measuring the level of inequality of opportunities. But a measure of relative inequality in the allocation of the opportunities, D , could be easily obtained by dividing the penalty, P , by the overall coverage rate, C . This measure might be constructed

as a “Dissimilarity Index” to measure dissimilar coverage rates across groups defined by circumstances. This index stands for the fraction of people who would need to have a good or service reassigned as a percentage of all people who have access to the good or service. Accordingly, $(1-D)$ would stand for the percentage of available opportunities that were properly allocated. It can be shown that

$$\mathbf{HOI} = \mathbf{C} - \mathbf{P} = \mathbf{C} * (1 - \mathbf{D})$$

Hence, the HOI can be seen as the average coverage rate, discounted by one minus the inequality index, D . An alternative interpretation of the Dissimilarity Index is that it is proportional to the difference between group-specific coverage rates and average coverage rates. The larger the difference, the larger is D . If all group-specific coverage rates are equal to the average, $D=0$, and the HOI is equal to the overall average coverage rate (C).

Decomposing changes in the HOI: composition and coverage effects

The HOI is determined by group-specific coverage rates and their corresponding population shares (the distribution of circumstances).⁷ As a result, the HOI

⁷ The overall coverage rate C is given by $C = \sum_k W_k C_k$ where W_k denotes the population share of circumstance-group k and C_k its specific coverage rate. It can be shown that, groups with specific coverage rates below (above) average are over (under) weighted relative to their population share. The HOI can be expressed as $HOI = (1 + \alpha) \cdot \sum_{k \in V} W_k C_k + \alpha \sum_{k \notin V} W_k C_k$ where $V = \{k: C_k < C\}$ denotes the set of all vulnerable circumstance-groups and, $\alpha = \sum_{k \notin V} W_k$ is the population share of non-vulnerable groups. The extent to which specific coverage rates are over- or under-weighted to obtain the HOI depends only on the share of the population in vulnerable groups (circumstance groups with specific coverage rates below average).

can only change when at least one of these two features changes. Hence, any change in the index can be traced either to changes in the distribution of circumstances (composition effect) or to changes in at least some group-specific coverage rates (coverage effect). The coverage effect can be further decomposed into changes due to changes in equality of opportunity (equalization effect) and changes due to average coverage rates (scale effect). Below we discuss the intuition behind each effect. A numerical example and a box with the algebra of the decompositions are found in Annexes 2 and 3.

The composition effect

Even though any change in the HOI can always be decomposed into composition and coverage effects, these two components do not have the same importance. The HOI measures progress towards the goal of opportunities for all. What matters is how far group-specific coverage rates are from the ideal of 100 percent. The distribution of circumstances is only used to weight the remaining gaps. If equality of opportunity prevails and all group-specific coverage rates are equal, changes in the distribution of circumstances will have no effect on the HOI. And once all group-specific coverage rates reach 100 percent, the goal will be reached irrespective of the distribution of circumstance.

Nevertheless, while inequality of

opportunity remains large, changes in the HOI could still come from changes in the distribution of circumstances, known as the composition effect. Most of the composition effect reflects structural demographic changes, overall economic development and increased investments in education. In certain cases, reducing the share in the population of certain groups could be, at least temporarily, an effective instrument to progress towards universal coverage. For instance, if malnutrition rates among children from income poor families are hard to reduce, an alternative policy could be to decrease the proportion of children in poor families through income transfers.

The coverage effect: scale and equalization

Progress in coverage can be achieved in two very distinct ways. One would be to increase all group-specific coverage rates proportionally. In this case, the degree of equality of opportunity would remain unchanged and the HOI would increase exclusively due to a change in the average coverage rate. We call this type of change a scale effect.

On the other hand, progress could be achieved by increasing coverage rates among vulnerable groups, compensated by a concomitant decrease in coverage rates among non-vulnerable groups that would hold the overall coverage rate unchanged. In this case, since the overall rate remains unchanged, the HOI

increases only due to the decline in the degree of inequality of opportunity. We call this type of change an equalization effect.

All changes in coverage can be expressed as a combination of a scale and an equalization effect. Hence, in principle the coverage effect can always be further decomposed into a scale and an equalization effect.

1.3. Empirical Considerations for Constructing the Human Opportunity Index

The HOI is constructed in three steps. First, we must select a specific basic good or service to focus on, and define minimum standards to fully characterize access. Second, we must choose a set of relevant circumstances. Third, based on microdata from household surveys we compute the coverage rate and the penalty for the specific basic good or service at hand.

Basic Goods and Services Considered and Minimum Standards

The HOI focuses on access to key goods and services by children 16 years of age and under. Independent of the intrinsic value of measuring access to key goods and services by children, focusing on this age range obviates the need to make any distinction between access and utilization related to effort, attitudes

or preferences of the child or parents. The assumption is that as long as society agrees on universalizing an opportunity, it must ensure utilization by children, independently of the preferences of the child or her family.

In principle, a set of the most basic goods and services for children is quite large, covering a wide range of what is needed for children to develop themselves and pursue a life of their choice. In order to make cross-country comparisons, we need comparable information on basic goods and services for all countries considered. The challenge stems from different survey terminologies and sometimes different national standards regarding adequate levels of service. For instance, access to safe water must have the same meaning and be measured similarly in all countries. To ensure comparability across countries and over time, a set of five indicators was chosen to represent the dimensions of education and housing (see Annex 4 for more details on the indicators).

a) **Education Dimension.** To capture the effective opportunity to quality education we use *completion of sixth grade at the proper age* (13 years old). Children completing sixth grade on time are more likely to have had access to schools of reasonable quality that ensure minimum learning and consequently can avoid unnecessary grade repetition. Some education systems in the region, however, adopt

automatic promotion while others do not, leading to potential inter-country comparability problems. To balance the potential comparability due to automatic promotions, we include *school attendance of children 10 to 14 years old* as an additional indicator.

b) **Housing Dimension.** To evaluate the opportunity to an enhanced quality of life we use the access to basic housing services: (i) *safe water*, (ii) *adequate sanitation*; and (iii) *electricity*.

(i) **Access to safe water and adequate sanitation.** Water and sanitation are primary drivers of public health. A vast literature finds a strong negative relationship between children's mortality rates and improved water sources and sanitation facilities (Abou-Ali Hala 2003; Galiani, Gertler, and Schargrodsky 2005; Fuentes, Pfütze, and Seck 2006; and Rutstein 2000; among others). Improved water and sanitation are linked to reduced incidence of diarrhea and related serious long-term consequences such as malnutrition and opportunistic infections (such as pneumonia), and physical or mental stunting. Moreover, WHO estimates that every year 1.4 million children under the age of five die from diarrheal diseases attributed to unsafe water

supply and inadequate sanitation and hygiene (WHO 2002).

(ii) **Access to electricity.** Electricity enhances the quality of life in a number of ways. First, it can promote a healthier lifestyle, for instance by improving air quality as electric stoves replace indoor biomass cook stoves. This is particularly helpful for young children and mothers. Replacing kerosene lamps with electricity has also been shown to reduce eye irritation, coughing, and nasal problems, and reduce the substantial number of children who die annually from accidental kerosene poisoning (Kaufman et al. 2000). But perhaps more importantly, there are other opportunities opened by access to electricity: improved conditions for studying in the evenings; accessing information and entertainment via radio, television, and the Internet; freeing parents' time from domestic chores so they could potentially spend that time raising their children; and home and community safety. Studies have documented that children spend more time studying after electricity is provided (Gustavsson 2007); electricity also allows access to modern educational techniques using computing, as in rural Peru (Bajak 2007).

To ensure inter-country comparability we opt to use the simplest possible concept for adequate access to water, sanitation and electricity. Most surveys in the region do not ask directly about potable (safe) water, but about the location and type of the water source and the system used for distribution. As a result, we consider as having access all households with water from the public network inside the dwelling. For sanitation, we consider as having access all households that have flush toilets inside the property that are connected to a waste removal system. For electricity, we consider access from any source adequate.

The basic goods and services used in this study all vary extensively in quality. It is clear that, for example, access to schooling hides a large variance in the quality of the service, while frequent blackouts, rationing and diminished wattage hinder the benefits a family can draw from access to electricity. Data access and comparability limitations make it difficult to gauge quality in basic goods and services. At this stage, for comparability purposes, the analysis is limited to indicators that measure quantity and not quality. Further analysis at the country level should incorporate the quality dimension, both because quality of services is a critical area of improvement in all countries, and also because there are large inequalities of quality of services across different groups of the population.

Choosing Circumstances

By circumstances we mean personal, family or community characteristics that a society believes should play no role in determining access to basic opportunities. For instance, most societies would agree that opportunities to access key goods and services should not be based on gender, ethnicity, nationality, parental background or religion. To the extent that equal opportunity requires independence from socioeconomic origin, parents' education and family income should also be treated as circumstances. Location of residence (urban vs. rural) may also be considered a circumstance, to the extent that a society believes that all children should have equal access to the same opportunities independently of where they live. This wide scope of circumstances represents a major challenge to any empirical work, due to data limitations.

Moreover, to assess the relative performance of different countries requires a set of empirically tractable circumstances and basic goods and services. Unfortunately, such a set—available for all countries—is limited. Instead, we must use information collected with reasonably similar methods across countries. For instance, if we wish to use family income as a circumstance, we must construct compatible income aggregates for all countries. However, some important circumstances, like ethnicity, have

distinct categories in different contexts, so they are trickier to use in regional studies. While in Brazil, Colombia and Panama the distinction between African and European descendents may be of major importance, in Guatemala and Bolivia the most important distinction maybe between indigenous people and European descendents. This type of variable is therefore difficult to use in a study that compares a set of countries. For this study, to ensure comparability across countries and also over time, a set of seven circumstances was chosen:

1. Parents' education (to capture socioeconomic origin)
2. Family per capita income (to capture availability of resources)
3. Number of siblings (to capture the dependency ratio)
4. The presence of both parents (to capture family structure)
5. Gender of the child (to capture one direct form of discrimination)
6. Gender of the household head (to capture one indirect form of discrimination)
7. Urban or rural location of

residence (to capture spatial disparities)

Computing the Human Opportunity Index for Access to a Basic Good or Service

Given a random sample of the population, with information on whether child i had access to a given basic good or service, and a vector of variables indicating her circumstances, we first use a regression model to estimate the empirical relationship between each circumstance and access to basic service. We then are able to predict the probability of access to a basic service for each individual with a given set of circumstances as well as the overall coverage rate. The next step is the core of the concept of inequality of opportunity, as we seek to derive an overall estimate of the extent of the variation in the coverage rates of individual children in the target population compared to the average coverage. The greater the variation, the higher the inequality of opportunity and the smaller the HOI (Box 2).

Box 2: The Six Steps to Build the Human Opportunity Index

1. Estimate a separable logistic model on whether child i had access to a given basic good or service as a function of his or her circumstances. For education, age was also used to predict the probability of completing each grade. The specification was chosen according to the needs of each circumstance: quadratic for years of education, logarithmic for real income, and categorical for age and the other dimensions. In all cases, the functions are linear in the parameters. From the estimation of this logistic regression, obtain coefficient estimates.

2. Given these coefficient estimates, obtain for each child in the sample the predicted probability of access to the basic good or service in consideration, \hat{p}_i based on the predicted relationship, $\hat{\beta}_k$, and a vector of their circumstances x_{ki} .

$$\hat{p}_i = \frac{\text{Exp}\left(\hat{\beta}_o + \sum_{k=1}^m x_{ki} \hat{\beta}_k\right)}{1 + \text{Exp}\left(\hat{\beta}_o + \sum_{k=1}^m x_{ki} \hat{\beta}_k\right)}$$

3. Compute the overall coverage rate C ,

$$C = \sum_1^n w_i \hat{p}_i$$

where $w_i = \frac{1}{n}$ or some sampling weights.

4. Compute the Dissimilarity Index D

$$\hat{D} = \frac{1}{2C} \sum_{i=1}^n w_i |\hat{p}_i - C|$$

5. Compute the penalty, $P = C * \hat{D}$

6. Compute the HOI = $C - P$

Constructing an Overall Human Opportunity Index

To generate a single measure of the distribution of opportunities for children, we need to construct an overall synthetic HOI comprising all basic goods and services under consideration. The overall HOI, in this study, is a simple average of the HOI of the two dimensions considered: education and housing. The HOI for education is a simple average of the HOI for completion of sixth grade on time and the HOI for school attendance for children 10-14. The HOI for housing

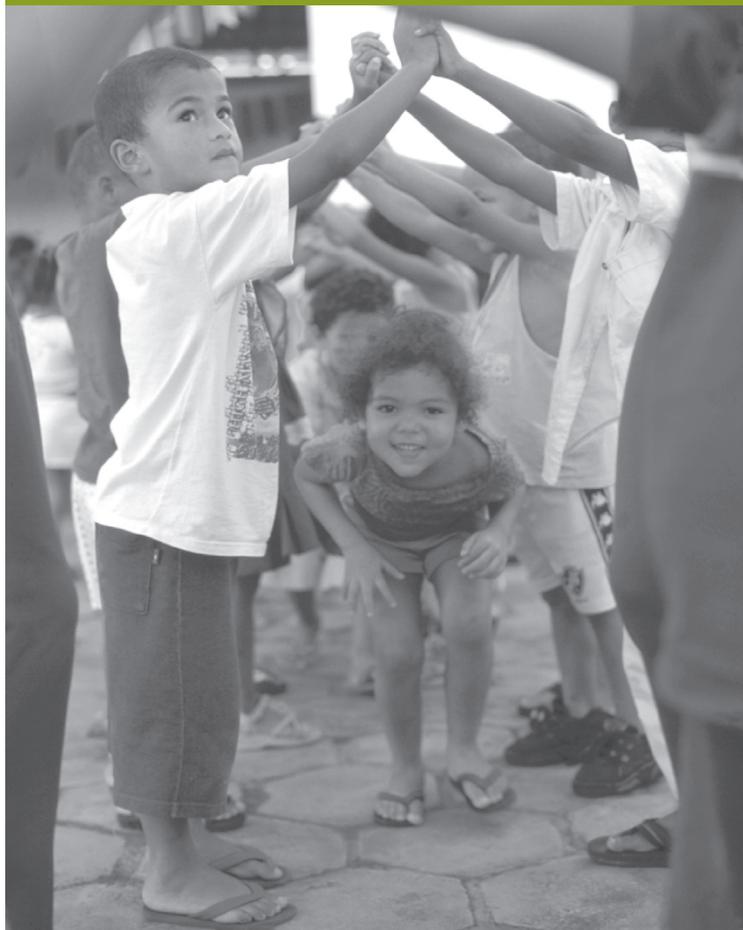
is a simple average of the HOI for access to water, the HOI for sanitation, and the HOI for electricity.⁸

The next chapter presents the empirical results for the HOI for the Latin America and Caribbean region. It tracks the changes children have faced in accessing opportunities to education and housing services in the region between 1995 and 2010 and decomposes the contributions of the composition and coverage effects, and presents a snapshot of how circumstances have affected inequality of opportunity for the region's children in the last fifteen years.

⁸ See Annex 5 for a brief discussion on alternatives for the aggregation sequence for building the overall HOI.

Chapter

2



The State of Human Opportunities for Children in the Latin American and Caribbean Region: 1995-2010

Chapter 2

The State of Human Opportunities for Children in the Latin American and Caribbean Region: 1995-2010

Since the mid-1990s, policy makers in Latin America and the Caribbean have increased spending on basic social services, reflecting the increased priority placed on these services in poverty reduction and development strategies. To what extent have these efforts translated into improved opportunities for the children of Latin America and the Caribbean (LAC) to access basic social services, regardless of their circumstances? This chapter reviews the Human Opportunity Index (HOI) for children in the region over the past 15 years and assesses how effective countries have equitably expanded access to the basic education and housing services that a child needs to be able to lead a life of her choosing. The results reveal slow but steady progress in the region as a whole, but they also underscore that progress has not been uniform and that children in some countries face significantly higher obstacles. Since 1995, opportunities for children in the LAC region have expanded by 1 percentage point per year. However, it will take a projected 24 years—an entire generation—to achieve universal provision of basic education and housing services in the region, based on the recent pace of progress and 2010 estimates. If current trends continue, Central American countries will take

longer on average—37 years—while Andean countries are poised to achieve universality in 18 years.

Countries in the LAC region show significant variation in children's opportunities to access basic services. In Chile, 95 percent of children have an equal opportunity to access basic services, compared to only 51 percent of the children in Honduras. Chile, Uruguay, Mexico, Costa Rica, Venezuela, and Argentina all have HOI scores above 85, while four Central American countries remain below 60.

Overall, countries have been more successful in providing equitably allocated opportunities in the area of education than in housing. Just over four-fifths of the region's children have equal access to basic education services, with the greatest challenges relating to the quality of those services (ability to finish sixth grade on time) compared with access alone (school enrollment). Just over two-thirds of all children have equal opportunities to access basic housing services, with water and sanitation being the most challenging for countries to provide.

What are the main drivers behind inequality of opportunities for children in the region? The results suggest that among the seven circumstances

considered, parental education, income and location are the most important in determining inequality of opportunity. Parental education has the largest effect on inequality of opportunity for education, suggesting important constraints for inter-generational mobility. Whether or not a child lives in a rural or urban area, and to a lesser extent per capita family income, are the most important circumstances affecting equality of opportunity for housing.

More than half (about 55 percent) of the improvement in the LAC HOI in the last 15 years reflects changes in the seven circumstances of children that are tracked by the study. That is, more than half of the change in the HOI is due to the fact that fewer children are in disadvantaged circumstance groups, for example because parental education improved, per capita family income increased, or families migrated from rural to urban areas.

By contrast, less than half (45 percent) of the improvements in the HOI are explained by changes in the likelihood that children with a given set of circumstance (i.e., residence in rural areas, with illiterate parents, with four siblings, etc.) will be able to access basic services. Of that 45 percent, most of the change reflects improved coverage rates for all children, while only 10 percent arises from a reduction in inequality of opportunity—the relative expansion of access to basic services for children in vulnerable circumstance groups vis-à-

vis non-vulnerable groups. Improving the targeting policies of basic services to children in vulnerable circumstance groups could lead to a significant rise in the HOI.

This chapter is organized as follows. Section 2.1 characterizes the expansion of the HOI across the 19 LAC countries and discusses data sources and methodology. Section 2.2 discusses the current state of the HOI in the LAC region, while Section 2.3 focuses on the evolution of the HOI over time and Section 2.4 reviews the drivers of this evolution. Section 2.5 outlines the forces behind inequality of opportunity, as an input to policymakers to better target policies in favor of excluded circumstance groups.

2.1. Progress in Improving Human Opportunities in LAC—Although Universality Remains a Generation Away

Human opportunity in LAC has expanded markedly over the last 15 years. The HOI for the 18 countries surveyed grew by an average of 1 percent per year between 1995 and 2010, reflecting improvements in the overall coverage rate and equity of access, as well as fewer children in disadvantaged circumstance groups (Table 2.1).¹ The HOIs are estimated using data from 37 household surveys for 19 LAC countries over a period of more than a decade (circa 1995 and circa 2008) (Annex Table A2.1). Together, the surveys represent more than 200 million children ages 0-16.

The expansion of coverage rates played a larger role in improving the HOI, but the penalty for unequal access to human opportunities also declined, with its negative impact on the overall HOI decreasing from 11 percent in circa 1995 to 7 percent in circa 2008. The

exception was Honduras, Guatemala and Nicaragua, where the penalty either increased or remained constant as little progress was achieved in improving access among opportunity-vulnerable groups relative to non-opportunity-vulnerable groups.

¹ Bolivia is an exception, for which only one year of data was used. Consequently estimates of rates of change or of extrapolated values and future projections were not possible for Bolivia. In addition, the varying dates of surveys used for the HOI pose serious comparability challenges. To reduce this comparability problem, we use the two point estimates to extrapolate forward and obtain an estimate for 2010 overall HOI, given the recent level and pace of change of the overall HOI for each particular country in the sample. Similarly, we interpolate all countries to a common base year, 1995. This adjustment permits us to assess countries at a similar point in time.

Table 2.1 Human Opportunity Index, Coverage Rate and Penalties, Circa 1995 and 2008

Human Opportunity Index, Coverage Rate and Penalties Circa 1995 and 2008							
Country	HOI (Circa 1995)	HOI (Circa 2010)	Annual Change	Coverage Rate (Circa 1995)	Coverage Rate (Circa 2010)	Penalty (Circa 1995)	Penalty (Circa 2010)
Argentina	86.1 (1998)	88.3 (2008)	0.22	89	91	3	2
Bolivia		69 (2007)			77		
Brazil	57 (1995)	76 (2008)	1.44	66	80	9	5
Chile	83 (1996)	92 (2006)	0.86	88	94	5	2
Colombia	67 (1997)	79 (2008)	1.06	77	85	10	6
Costa Rica	77 (1994)	88 (2009)	0.73	82	91	5	2
Dominican Republic	64 (2000)	73 (2008)	1.11	71	78	8	6
Ecuador	60 (1995)	76 (2006)	1.45	68	82	8	6
El Salvador	44 (1998)	53 (2007)	0.99	54	61	10	8
Guatemala	43 (2000)	51 (2006)	1.36	51	59	8	8
Honduras	42 (1999)	48 (2006)	0.83	50	57	8	9
Jamaica	79 (1996)	81 (2002)	0.29	82	84	3	2
Mexico	65 (1996)	86 (2008)	1.74	73	90	8	4
Nicaragua	35 (1998)	46 (2005)	1.61	43	56	8	9
Panama	66 (1997)	69 (2003)	0.49	75	76	9	8
Paraguay	61 (1999)	71 (2008)	1.14	65	76	4	5
Peru	55 (1998)	69 (2008)	1.39	65	76	10	8
Uruguay	89 (2006)	90 (2008)	0.71	92	93	3	2
Venezuela, R.B de	82 (1995)	87 (2005)	0.45	86	90	4	3
LAC Average	64	73	0.99	71	79	7	5

Source: Author's calculations based on household surveys
(Actual survey years in parenthesis)

A Generation to Universalize Basic Services in LAC

Based on the recent rates of progress and assuming linear expansion, the region is projected, on average, to take 24 years starting in 2010 to universalize the basic services contained in the overall HOI (Table 2.2), thus providing

all children with a level playing field.² Central America and the Caribbean will take longer than the regional average—37 and 30 years, respectively—while the Southern Cone and Andean nations are projected to take on average 18 years. Mexico and Brazil will require six and 15 years respectively to achieve the goal of universal access to basic services.

² Assuming a linear expansion, we estimate the year of achieving universal coverage by: $(100 - \text{current HOI}) / \text{annual rate of growth}$. The results are essentially the same if we assume that “universality” is achieved with a coverage rate of 98 percent. With this latter assumption it will take 22 years instead of 24 to universalize the basic services contained in the HOI. The linearity assumption can be also seen as optimistic. If we consider that there is a slowdown in the pace of progress as the HOI approaches universality, as the evidence suggests (see Chapters 3 and 4), it will take much longer to universalize the set of basic services considered.

Table 2.2 Estimated 2010 Overall Human Opportunity Index and Simulated Arrival Date by Sub-region

Estimated 2010 Overall Human Opportunity Index and Simulated Arrival Date by Sub-region

Country	Estimated HOI 2010	Rate	Simulated Years to arrival	Simulated Arrival Date
Andean Countries	81	1.1	18	2028
Bolivia				
Colombia	81	1.1		
Ecuador	82	1.4		
Peru	71	1.4		
Venezuela	89	0.5		
Brazil	79	1.4	15	2025
Caribbean Countries	79	0.7	30	2040
Dominican Republic	75	1.1		
Jamaica	84	0.3		
Central America	63	1.0	37	2047
Costa Rica	89	0.7		
El Salvador	56	1.0		
Guatemala	57	1.4		
Honduras	51	0.8		
Nicaragua	54	1.6		
Panama	73	0.5		
Mexico	90	1.7	6	2016
Southern Cone	87	0,7	18	2028
Argentina	89	0.2		
Chile	95	0.9		
Paraguay	73	1.1		
Uruguay	92	0.7		
LAC Average	77	1.0	24	2034

Source: Author's calculations based on household surveys

The region will take, on average, almost a generation—22 years—to universalize basic education services, based on the 2010 levels and recent growth rates (Table 2.3). Mexico is expected to universalize access to education opportunities within the next decade, and the Andean countries will follow by 2023. Central American countries and Brazil will take longer than the LAC average—27 years—while the

Southern Cone countries will require 38 years to reach an education HOI of 100. Looking at the two basic services contained in the education component of the HOI—completing sixth grade on time and attending school for 10-14 year-olds—suggests that the greatest challenges are in completing sixth grade on time, especially in Central American countries.

Table 2.3 Estimated 2010 Human Opportunity Index for Education and Simulated Arrival Date by Sub-region

Country	2010 Estimates of HOI for				Simulated years to arrival	Simulated Arrival Date
	Sixth grade on time	School attendance	Education	Rate		
Andean Countries	79	93	86	1.0	13	2023
Bolivia						
Colombia	74	94	84			
Ecuador	85	88	87			
Peru	79	96	87			
Venezuela	79	96	87			
Brazil	38	99	68	1.2	27	2037
Caribbean Countries	77	96	87	0.6	22	2032
Dominican Republic	57	96	77			
Jamaica	97	96	96			
Central American	52	91	71	1.1	27	2037
Costa Rica	67	96	82			
El Salvador	47	92	70			
Guatemala	30	85	57			
Honduras	52	87	70			
Nicaragua	41	91	66			
Panama	74	93	84			
Mexico	90	94	92	1.1	7	2017
Southern Cone	77	95	86	0.4	38	2048
Argentina	82	97	89			
Chile	85	99	92			
Paraguay	58	92	75			
Uruguay	81	94	88			
LAC Average	68	94	81	0.9	22	2032

Source: Author's calculations based on household surveys

The LAC region will take, on average, approximately 25 years to universalize access to the three basic services included in the housing HOI—access to water, sanitation and electricity—based on 2010 levels and recent growth rates (Table 2.4). Brazil and Mexico are expected to universalize access to housing services within the next decade, while the

Southern Cone countries are posed to achieve universal access by 2022, and the Andean countries by 2032. In contrast, it will take the Central American countries almost two generations (48 years) to provide full coverage to all children to basic opportunities in housing, and 36 years for the Caribbean countries.

Table 2.4 Estimated 2010 Human Opportunity Index for Housing and Simulated Arrival Date by Sub-region

Estimated 2010 Human Opportunity Index for Housing and Simulated Arrival Date by Sub-region 2010 Estimated HOIs for							
Country	Water	Electricity	Sanitation	Housing	Rate	Simulated years to arrival	Simulated Arrival Date
Andean Countries	71	88	66	75	1.1	22	2032
Bolivia							
Colombia	71	94	69	78			
Ecuador	82	94	53	76			
Peru	43	67	58	56			
Venezuela	87	99	85	90			
Brazil	86	99	81	89	1.7	7	2017
Caribbean Countries	43	98	74	72	0.8	36	2046
Dominican Republic	71	98	50	73			
Jamaica	16	98	98	71			
Central America	51	72	42	55	0.9	48	2058
Costa Rica	95	99	94	96			
El Salvador	18	88	19	42			
Guatemala	68	73	26	56			
Honduras	22	54	21	32			
Nicaragua	16	55	58	43			
Panama	85	64	33	60			
Mexico	88	100	75	88	2.4	5	2015
Southern Cone	89	99	76	88	1.0	11	2021
Argentina	98	100	66	88			
Chile	98	100	94	97			
Paraguay	69	96	48	71			
Uruguay	93	99	97	96			
LAC Average	67	88	62	72	1.1	25	2035

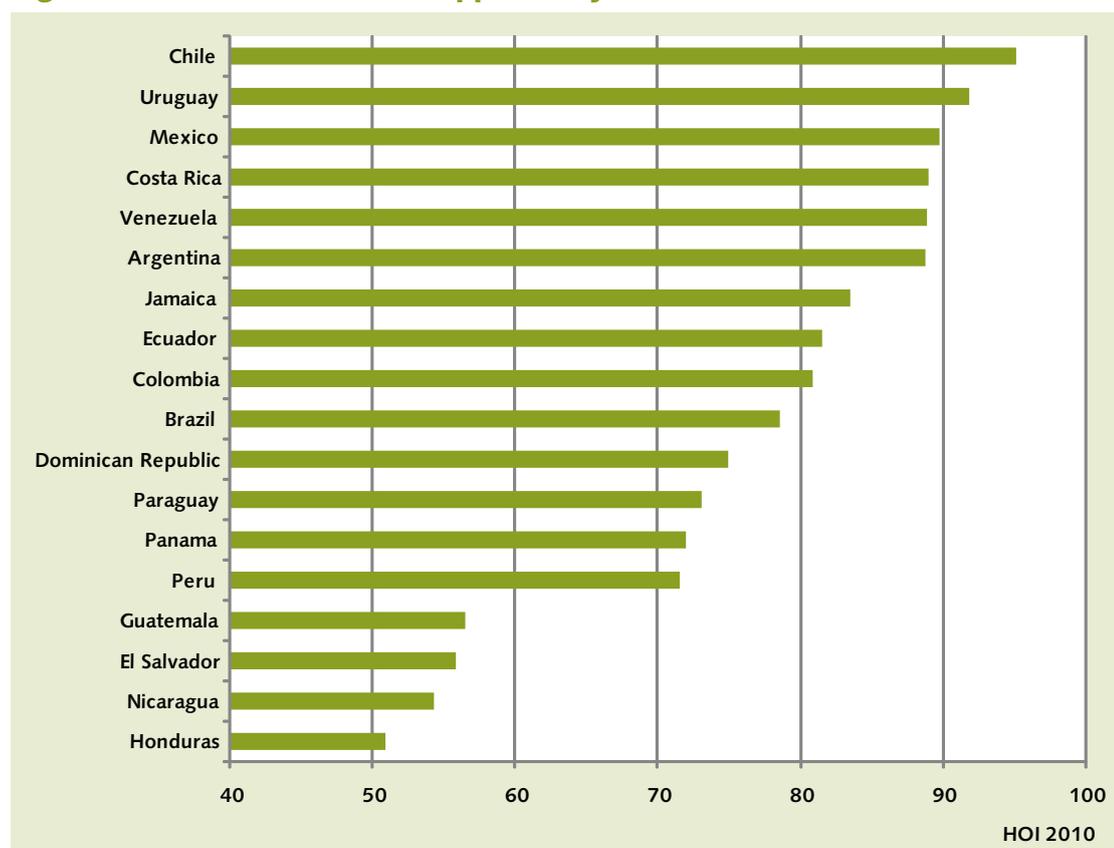
Source: Author's calculations based on household surveys

2.2. Opportunities for Children to Access Basic Services in the LAC Region

The distribution of human opportunities estimated for 2010 is highly varied across the region. The playing field is almost level for children in Chile, where 95 percent of basic housing and education services are available and equitably allocated, whereas in Honduras just over half (51 percent) of the services are available and distributed equitably among children. Chile, Uruguay,

Mexico, Costa Rica, Venezuela, and Argentina lead the region in moving towards universal access of basic services for their children. For each of these countries, the estimated 2010 overall HOI is higher than 85, meaning more than 85 percent of the services required for universal coverage are available and allocated equitably. Four countries from Central American are at the bottom of the ranking, with HOIs lower than 60: Honduras, Nicaragua, El Salvador, and Guatemala.

Figure 2.1: The 2010 Human Opportunity Index for LAC.



Source: Author's calculations based on household surveys

Children in LAC are more likely to have higher levels of equitably allocated services in education than housing: the HOI for education in the region is 81 compared to 72 for housing. Moreover, there is a wider range in accessing services equitably for housing than for education across countries in LAC.

The education HOI ranges from a high of 96 for Jamaica to a low of 57 for Guatemala, suggesting that children face almost a level playing field in accessing education in Jamaica while only slightly more than half of education services are available and equitably distributed in Guatemala. Eleven out of the 19 countries analyzed have an education HOI higher than 80. Jamaica, Mexico, and Chile each have an estimated education HOI higher than 90 for 2010.

Comparing the two indicators in the education HOI shows that countries in the region face more challenges in equitably ensuring that children complete sixth grade on time than ensuring that all children regardless of circumstances aged 10 to 14 attend school. While the average HOI for school enrollment is 94, the average HOI for completing sixth grade on time is only 68.

Similarly, the dispersion of the HOI for completing sixth grade on time is much higher than with school enrollment. While the HOI for completing sixth grade on time ranges from a high HOI of 97 for Jamaica to a low of 30 for Guatemala, the HOI for school enrollment ranges from 99 for Brazil and Chile to 85 for

Guatemala in 2010. The leaders of the HOI for completing sixth grade on time are Jamaica, Mexico, Ecuador and Chile, each with an HOI at or higher than 85. By contrast, El Salvador, Nicaragua, Guatemala and Brazil have HOIs lower than 50 for this indicator.

The housing HOI presents higher dispersion than the overall HOI, underscoring the uneven rates of progress in expanding opportunities for quality housing in LAC. The housing HOI is nearly universal in Chile (97), while it dips to as low as 32 in Honduras, indicating that only one third of the housing services are available and equitably allocated. Four countries in the region have achieved coverage rates in housing services adjusted for equality of opportunity at or above 90 in 2010: Chile, Uruguay, Costa Rica, and Venezuela. Only seven countries out of the 19 considered have a housing HOI higher than 80.

Disaggregating the housing HOI reveals that countries in LAC have been more successful in providing children with equitable access to electricity than in delivering equitable opportunities for children to live in homes with clean water and sanitation. While the average HOI for electricity is 88, the regional averages for water and sanitation opportunities are substantially lower, at 67 and 62, respectively. Thus, at least one-third of the region's children do not have equitable access to water and sanitation opportunities.

Opportunities to access water, sanitation and electricity in the region are also more widely dispersed compared to educational opportunities. The sanitation HOI ranges from a high of 97 in Uruguay to a low of 19 in El Salvador, while the water HOI ranges from 98 in Argentina and Chile to 16 for Nicaragua. This means that in El Salvador and Nicaragua less than one out of five children have an equal opportunity to live in homes with access to both clean water and sanitation. For electricity, Chile is estimated to have achieved universal provision by 2010 while Nicaragua has an electricity HOI of 55, indicating that just over half of the children have equitably distributed access to electricity.

Argentina, Costa Rica, and Chile lead in the provision of opportunities to access water, with HOIs higher than 90. By contrast, Jamaica, Nicaragua, and El Salvador have HOIs lower than 20 for this service. In sanitation, the leaders are Uruguay, Chile, Jamaica, and Costa Rica, with HOIs higher than 90, compared to HOIs below 50 for Honduras, Paraguay, Panama, Guatemala, and El Salvador. In electricity, 12 countries out of the 19 considered display an HOI higher than 90, and no country has electricity HOI lower than 55.

2.3 Expanding Human Opportunities in Latin America and the Caribbean: 1995-2010

Over the last 15 years, LAC countries have expanded children's opportunities for basic education and housing services. The overall HOI grew at an average pace of 1 percentage point per year since the mid-1990s (Table 2.5). Overall sanitation and sixth grade on time indicators saw the largest gains, with annual HOI growth rates of 1.3 points each. School enrollment and electricity, both of which have higher levels of HOIs, had smaller growth rates of 0.5 and 1 points per year, respectively.

Mexico showed the highest rate of improvement in the overall HOI, at 1.7 points per year, compared to a low of 0.2 points per year in Argentina. The five indicators that comprise the overall HOI show more variation over time, with expansion rates as high as 4.5 points annually for the sanitation HOI in Nicaragua and 4 points for the water HOI in Ecuador and Mexico. The fastest rate of expansion of the HOI for electricity was 1.9 points annually in El Salvador. In education, the fastest expansion of the HOI for completing sixth grade on time was 2.2 points annually in Peru, and 2.3 points annually for the school enrollment HOI in Mexico.

Table 2.5

Growth Rates by Indicators, Dimensions, and Overall Human Opportunity Index

Growth Rates by Indicators, Dimensions, and Overall Human Opportunity Index								
Country	Sixth grade on time	School Attendance	Education	Water	Electricity	Sanitation	Housing	Overall HOI
Argentina	-0.17	-0.02	-0.10	0.32	0.10	1.21	0.54	0.22
Brazil	1.53	0.81	1.17	2.02	1.24	1.86	1.70	1.44
Chile	0.81	0.11	0.46	1.07	0.70	2.01	1.26	0.86
Colombia	1.82	0.61	1.21	0.24	0.63	1.83	0.90	1.06
Costa Rica	0.61	0.75	0.68	0.24	0.51	1.59	0.78	0.73
Dominican Republic	1.87	-0.06	0.91	0.97	1.59	1.41	1.32	1.11
Ecuador	1.35	0.62	0.98	3.98	0.91	0.84	1.91	1.45
El Salvador	1.60	0.92	1.26	0.02	1.92	0.23	0.73	0.99
Guatemala	1.31	1.11	1.21	1.35	1.62	1.55	1.51	1.36
Honduras	1.73	1.30	1.52	0.81	0.57	-0.93	0.15	0.83
Jamaica	0.52	0.10	0.31	-0.86	1.75	-0.09	0.27	0.29
Mexico	1.66	0.60	1.13	4.08	0.74	2.24	2.35	1.74
Nicaragua	1.48	1.24	1.36	0.42	0.73	4.46	1.87	1.61
Panama	0.48	0.32	0.40	0.62	0.79	0.32	0.58	0.49
Paraguay	1.21	0.12	0.67	2.25	1.24	1.13	1.56	1.11
Peru	2.24	0.30	1.27	0.50	1.67	2.36	1.51	1.39
Uruguay	1.40	-0.43	0.48	2.15	0.35	0.33	0.94	0.71
Venezuela	1.13	0.25	0.69	0.07	0.05	0.52	0.21	0.45
LAC Average	1.25	0.5	0.87	1.12	0.95	1.27	1.12	0.99

Source: Author's calculations based on household surveys

2.4. Unpacking Changes in the HOI: Scale, Equity and Evolving Circumstances

Understanding what is behind the changes in the HOI is important for policy makers interested in leveling the playing field for children and ensuring that they are equipped to pursue a life of their choosing. The sources of expansion of the HOI can be classified into two main groups: (i) changes in circumstance group-specific coverage rates and (ii) changes in population shares among

the circumstance groups. Since the HOI is completely determined by the specific coverage rates and population shares, as discussed in Chapter 1, the HOI can only change when at least one of these elements changes. We refer to changes in the HOI due to changes in the distribution of circumstances as the composition effect. Changes in the HOI associated with changes in the group-specific coverage rates are referred to as the coverage effect.

Both Composition and Coverage Effects Drove Changes in the HOI

Slightly more than half (55 percent) of the improvement in the HOI can be explained by changes in the average circumstances of children in LAC, such as increased residence in urban areas and higher parental education and income levels. The remaining 45 percent of the observed expansion in the HOI reflects

gains in group-specific coverage rates for housing and education services (Table 2.6). Changes in the average circumstances of children in LAC (i.e., the composition effect) dominate the expansion of all the HOIs considered, except school enrollment where both effects are equally important and electricity where coverage effects are stronger.

Table 2.6 Share of Composition Effect in Total Change of Human Opportunity Indices

Share of Composition Effect in Total Change of Human Opportunity Indices

	Sixth grade on time	School Attendance	Education	Water	Electricity	Sanitation	Housing	Overall HOI
(In Percentage Points per year)								
Composition Effect	0.7	0.2	0.5	0.7	0.3	1.0	0.6	0.5
Total Change	1.3	0.5	0.9	1.1	1.0	1.3	1.1	1.0
(In Percent)								
Share of Composition Effect	54	50	53	63	33	75	57	55
Share of Coverage Effect	46	50	47	37	67	25	43	45

Source: Author's calculations based on household surveys

The growing access to education opportunities and the increased equality of those opportunities reflects mainly improvements in the circumstances of the average child, due to past improvements in educational opportunities (parental

education), overall economic growth (higher parental income) and/or the growing use of income transfer programs.³ On the other hand, strong coverage effects may reflect significant efforts to improve the overall provision

³ Changes in circumstances would not expand a child's opportunities in a society with completely equal opportunity, since all circumstance groups would have the same opportunities. However, in the context of significant inequality of opportunity, policies aimed at improving certain circumstances, such as family income or parents' education, may be instrumental in expanding a child's access to basic goods and services.

(scale effect) as well as the equitable allocation (equalization effect) of education services.

The composition and coverage effects contribute roughly equally to the expansion of the HOI for school enrollment among countries in the LAC region. In seven countries the coverage effect had a more prominent role; in seven other countries the composition

effect was more prominent; in two countries these two effects contributed equally (Brazil and Guatemala); and in two countries these effects were of similar magnitude but in opposite directions (Argentina and the Dominican Republic). In El Salvador, circumstance groups with lower coverage rates increased their population shares, making the composition effect negative.

Table 2.7 Expansion of Human Opportunity Indices in Education: Contribution of the Composition and Coverage Effects

Expansion of Human Opportunity Indices in Education: Contribution of the Composition and Coverage Effects

Country	Completing Sixth Grade on Time			School attendance (ages 10-14)		
	Total change (p.p)	Composition effect (p.p)	Coverage effect (p.p)	Total change (p.p)	Composition effect (p.p)	Coverage effect (p.p)
Argentina	-0.2	0.5	-0.7	0.0	0.1	-0.1
Brazil	1.5	1.1	0.5	0.8	0.4	0.4
Chile	0.8	0.6	0.2	0.1	0.1	0.0
Colombia	1.8	0.5	1.3	0.6	0.2	0.4
Costa Rica	0.6	0.6	0.0	0.7	0.3	0.5
Dominican Republic	1.9	1.4	0.4	-0.1	0.2	-0.2
Ecuador	1.3	-0.5	1.8	0.6	0.5	0.2
El Salvador	1.6	-0.4	2.0	0.9	-0.3	1.2
Guatemala	1.3	0.8	0.5	1.1	0.6	0.6
Honduras	1.7	0.6	1.2	1.3	0.2	1.1
Jamaica	0.5	0.2	0.3	0.1	0.0	0.1
Mexico	1.7	1.2	0.4	0.6	0.5	0.1
Nicaragua	1.5	0.5	1.0	1.2	0.4	0.8
Panama	0.5	0.7	-0.2	0.3	0.3	0.0
Paraguay	1.2	1.1	0.1	0.1	0.2	-0.1
Peru	2.2	0.7	1.6	0.3	0.2	0.1
Uruguay	1.4	1.1	0.3	-0.4	0.4	-0.8
Venezuela, R.B de	1.1	1.5	-0.3	0.3	0.2	0.1
LAC Average	1.3	0.7	0.6	0.5	0.2	0.2

Source: Author's calculations based on household surveys

The composition effect was more prominent in the housing HOI (Table 2.8), which is not surprising given the importance of location in determining access to better housing. The composition effect had a larger contribution than the coverage effect on expanding the water

HOI in 12 out of 18 countries considered. Similarly, the composition effect had a larger contribution than the composition effect in 11 out of 18 countries in the case of the sanitation HOI, and 12 out of 18 countries in the case of the electricity HOI.

Table 2.8 Expansion of the Human Opportunity Indices in Housing: Contributions by the Composition and Coverage Effect

Expansion of the Human Opportunity Indices in Housing: Contributions by the Composition and Coverage Effects

Country	Water			Sanitation			Electricity		
	Total change	Composition effect (p.p)	Coverage effect (p.p)	Total change	Composition effect (p.p)	Coverage effect (p.p)	Total change (p.p)	Composition effect (p.p)	Coverage effect (p.p)
Argentina	0.3	0.4	-0.1	1.2	2.5	-1.3	0.1	0.0	0.0
Brazil	2.0	1.1	0.9	1.9	2.0	-0.2	1.2	1.0	0.2
Chile	1.1	0.8	0.3	2.0	1.4	0.7	0.7	0.5	0.2
Colombia	0.2	0.5	-0.2	1.8	1.4	0.4	0.6	0.4	0.2
Costa Rica	0.2	0.1	0.1	1.6	0.7	0.9	0.5	0.2	0.3
Dominican Republic	1.0	1.2	-0.2	1.4	2.4	-1.0	1.6	1.4	0.2
Ecuador	4.0	-1.9	5.9	0.8	-2.6	3.5	0.9	-3.0	3.9
El Salvador	0.0	-0.9	0.9	0.2	-0.9	1.1	1.9	-0.9	2.9
Guatemala	1.3	0.8	0.5	1.5	1.0	0.6	1.6	1.2	0.4
Honduras	0.8	0.4	0.4	-0.9	0.5	-1.4	0.6	0.5	0.0
Jamaica	-0.9	0.2	-1.1	-0.1	0.0	-0.1	1.8	-0.2	2.0
Mexico	4.1	2.6	1.5	2.2	2.5	-0.2	0.7	0.5	0.2
Nicaragua	0.4	0.6	-0.2	4.5	0.4	4.0	0.7	0.8	-0.1
Panama	0.6	0.5	0.1	0.3	0.8	-0.5	0.8	1.0	-0.2
Paraguay	2.5	1.6	0.9	1.1	1.6	-0.5	1.2	0.7	0.6
Peru	0.5	0.7	-0.2	2.4	0.7	1.6	1.7	0.8	0.9
Uruguay	2.1	3.1	-0.9	0.3	1.0	-0.7	0.4	0.5	-0.1
Venezuela, R.B de	0.1	1.0	-1.0	0.5	1.8	-1.3	0.0	0.2	-0.1
LAC Average	1.1	0.7	0.4	1.3	1.0	0.3	1.0	0.3	0.6

Source: Author's calculations based on household surveys

The Equalization and Scale Effects

The coverage effect—the contribution of changes in the coverage rates of different circumstance groups—can be further decomposed into the equalization and scale effects. The scale effect captures the impact of proportional change in coverage rates for all circumstance groups,

whereas the equalization effect captures improved coverage rates specifically for circumstance groups with below-average coverage rates vis-à-vis groups with above-average coverage rates. The equalization effect is at the heart of equality of opportunities. A society that wants to level the playing field will focus on expanding opportunities mainly for

the vulnerable circumstance groups, and the equalization effect is a clear indicator of progress toward this goal.

Only 10 percent of overall HOI change was due to increased equality of opportunity—the equalization effect—in the sample of 18 LAC countries considered during the period covered.⁴ That is, improved targeting of basic services to children in vulnerable circumstance groups only accounted for about 10 percent of overall improvement. About 13 percent of the change of the HOI for education is due to increased equality of opportunity (13 percent in completing sixth grade on time and 15 percent on school attendance for ages 10-14). Only about 8 percent of the change of the HOI for housing is due to increased equality of opportunity (4 percent in water, 4 percent in sanitation,

and 18 percent in electricity). Equality of opportunity could accelerate more quickly if services were better targeted to under-served circumstance groups in the region.

The expansion of the education HOI due to the coverage effect is on the whole dominated by the scale effect (Table 2.9). That is, improved coverage rates came mainly by increasing education service provision for the entire population, not necessarily more to those who were previously under-served. However, there are eight cases out of 36 (18 countries for each of the two basic opportunities considered) where the equalization effect is the same size as the scale effect, and two cases where the equalization effect is a bit bigger than the scale effect (Guatemala and Paraguay for completion of sixth grade on time).

⁴ For more details see Annex Tables A2.2 to A2.4.

Table 2.9 Coverage Effect in Education Human Opportunity Indices: Contributions by the Equalization and Scale Effects

Coverage Effect in Education Human Opportunity Indices: Contributions by the Equalization and Scale Effects

Country	Completing Sixth Grade on Time			School attendance (ages 10-14)		
	Total coverage effect (p.p)	Equalization effect (p.p)	Scale effect (p.p)	Total coverage effect (p.p)	Equalization effect (p.p)	Scale effect (p.p)
Argentina	-0.7	-0.1	-0.6	-0.1	0.0	-0.1
Brazil	0.5	0.2	0.3	0.4	0.1	0.3
Chile	0.2	0.1	0.1	0.0	0.0	0.0
Colombia	1.3	0.5	0.8	0.4	0.1	0.3
Costa Rica	0.0	0.0	0.0	0.5	0.1	0.4
Dominican Republic	0.4	0.2	0.3	-0.2	0.0	-0.2
Ecuador	1.8	0.4	1.4	0.2	0.1	0.1
El Salvador	2.0	0.4	1.6	1.2	0.2	1.0
Guatemala	0.5	0.3	0.2	0.6	0.1	0.5
Honduras	1.2	0.2	0.9	1.1	0.2	0.8
Jamaica	0.3	0.0	0.3	0.1	0.0	0.1
Mexico	0.4	0.1	0.3	0.1	0.0	0.0
Nicaragua	1.0	0.1	0.9	0.8	0.2	0.6
Panama	-0.2	0.0	-0.2	0.0	0.0	0.0
Paraguay	0.1	0.1	0.0	-0.1	0.0	-0.1
Peru	1.6	0.4	1.2	0.1	0.1	0.1
Uruguay	0.3	0.1	0.3	-0.8	-0.2	-0.6
Venezuela, R.B de	-0.3	0.0	-0.3	0.1	0.0	0.0
LAC Average	0.6	0.2	0.4	0.2	0.1	0.2

Source: Author's calculations based on household surveys

Regarding changes of the housing HOI driven by the coverage effect, the scale effect also is generally dominant (Table 2.10). This indicates that in housing as well, progress has mainly been achieved through greater overall coverage rates, rather than improved targeting to reach children in under-served circumstance groups. However, in three out of 53 cases (18 countries for access to water and sanitation, and 17 countries for

access to electricity) the equalization effect dominates: Panama and Paraguay in the case of water and Mexico in the case of sanitation. In the case of Mexico, the overall coverage effect has been contractive. That is, changes in the coverage specific rates, especially reduced coverage among the vulnerable groups, have contributed to reducing the HOI for sanitation in Mexico.

Table 2.10

Coverage Effect in Housing Human Opportunity Indices: Contributions by the Equalization and Scale Effects

Coverage Effect in Housing Human Opportunity Indices: Contributions by the Equalization and Scale Effects

Country	Water			Sanitation			Electricity		
	Total coverage effect (p.p)	Equalization effect (p.p)	Scale effect (p.p)	Total coverage effect (p.p)	Equalization effect (p.p)	Scale effect (p.p)	Total coverage effect (p.p)	Equalization effect (p.p)	Scale effect (p.p)
Argentina	-0.1	0.0	0.0	-1.3	-0.3	-1.0	0.0	0.0	0.0
Brazil	0.9	0.3	0.5	-0.2	0.0	-0.2	0.2	0.1	0.1
Chile	0.3	0.1	0.2	0.7	0.2	0.4	0.2	0.1	0.1
Colombia	-0.2	0.1	-0.3	0.4	0.1	0.3	0.2	0.1	0.1
Costa Rica	0.1	0.0	0.1	0.9	0.3	0.6	0.3	0.1	0.2
Dominican Republic	-0.2	0.0	-0.2	-1.0	-0.3	-0.7	0.2	0.1	0.2
Ecuador	5.9	0.1	5.7	3.5	0.3	3.2	3.9	1.0	2.8
El Salvador	0.9	0.0	0.8	1.1	0.1	1.0	2.9	0.9	2.0
Guatemala	0.5	0.1	0.4	0.6	0.2	0.3	0.4	0.2	0.2
Honduras	0.4	0.2	0.2	-1.4	-0.6	-0.8	0.0	0.0	0.0
Jamaica	-1.1	-0.4	-0.7	-0.1	0.0	-0.1	2.0	0.3	1.7
Mexico	1.5	0.5	1.0	-0.2	-0.2	0.0	0.2	0.1	0.1
Nicaragua	-0.2	-0.1	-0.1	4.0	0.7	3.4	-0.1	-0.1	0.1
Panama	0.1	0.2	-0.1	-0.5	-0.1	-0.4	-0.2	0.0	-0.2
Paraguay	0.9	-0.6	1.6	-0.5	-0.2	-0.3	0.6	0.2	0.4
Peru	-0.2	0.0	-0.2	1.6	0.6	1.0	0.9	0.4	0.5
Uruguay	-0.9	-0.4	-0.5	-0.7	-0.2	-0.5	-0.1	-0.1	-0.1
Venezuela, R.B de	-1.0	-0.2	-0.7	-1.3	-0.4	-0.9	-0.1	0.0	-0.1
LAC Average	0.4	0.0	0.4	0.3	0.0	0.3	0.6	0.2	0.5

Source: Author's calculations based on household surveys

In summary, only rarely has the equalization effect played a more prominent role within the coverage effect. The default situation seems to be a dominance of the scale effect. In only four cases (out of 89 considered) does the equalization effect dominate and have a positive effect. This indicates that Latin American countries could make far more effective use of their resources to provide basic opportunities to their children by improving the targeting of social service provision to those most in need.

2.5 The Inequality of Opportunity Profile

To level the playing field for all children, policy makers need to know the equality of opportunity profile for a given society to design effective public policies for accelerating the equitable expansion of human opportunities. This section analyzes the main circumstances affecting equality of opportunity for access to a basic service, and the relative effect on this opportunity of a specific circumstance—such as gender, where a child lives, or their parent's income—compared to other circumstances. The equality of opportunity measure D—the methodology for which is explained in Chapter 1—is a synthetic measure that aggregates the differences in coverage among all groups arising

from a defined set of circumstances.⁵ In addition, it is also possible to measure the equality of opportunity associated with only one specific circumstance. For policy design, it may be important to analyze how each circumstance contributes to overall inequality of opportunity. Moreover, a constant level of overall equality of opportunity over time may hide important changes. For example, equality of opportunity in education resulting from urban or rural location may be increasing, while inequality of opportunity in education resulting from differences in a parent's education may be declining.

To compute the synthetic D-index, all circumstances are considered simultaneously. An equality of opportunity profile can also be defined by computing a specific D-index for each circumstance (gender, parent's education, and so forth), and then comparing them to identify which specific circumstances elicit larger inequality in a given basic good or service. There are complementary ways of reporting an equality of opportunity profile for the LAC region: (i) a profile based on the average D-indices in the region, and (ii) a profile based on the number of countries where one specific circumstance is more important in characterizing existing

equality of opportunity.

A specific D-index can be computed for each of the seven circumstances for each of the basic goods and services considered, averaged across the LAC region (Table 2.11; country results are reported in Annex Tables A.2.5–A2.9). These numbers represent the proportion of the available basic good or service that would have to be redistributed among children for equality of opportunity to prevail, if only one circumstance was considered. For example, for access to water, the average D-indices calculated for each circumstance range from 0.3 percent for gender of the child to 7 percent for area of residence. Hence, if the only circumstance considered is area of residence, 7 percent of available water connections need to be reallocated to eliminate the differences in access to water across different groups. When considering a child's gender, only 0.3 percent of available water connections need to be reallocated in LAC to eliminate the differences in access to water.

The inequality of opportunity profile for education shows that in LAC, parental education and income continue to influence whether or not a child has fair access to education opportunities. In short, parental characteristics affect the ability of a child to improve her situation

⁵ The equality of opportunity measure, D, is used to estimate the penalty that discounts the overall coverage rate. As discussed in Chapter 1, the penalty is the product of the inequality of opportunity measure and the overall coverage rate ($P=C*D$).

over time and achieve inter-generational mobility. For completing sixth grade on time, the most important circumstance in LAC countries is parental education, and to a lesser extent the gender of the child and number of siblings. A complementary profile, based on the number of countries where one specific D-index dominates, confirms these findings. Parental education dominates the rankings in 17 out of 18 countries; while the number of siblings dominates the rankings in one country (Annex Table

A2.5).

For school enrollment for children aged 10-14, the inequality of opportunity profile is also driven mainly by parental education. The profile based on number of countries shows that parental education dominates the rankings in 15 countries. The presence of two parents in a child's household tops the rankings in two countries, while per capita family income dominates in one country (Annex Table A2.6).

Table 2.11

D-Index by Circumstance and Opportunity, Circa 2010

D-Index by Circumstance and Opportunity, Circa 2010

Circumstances	Sixth Grade on Time	School Attendance	Water	Sanitation	Electricity
Parent's education	5.2	1.2	4.3	7.5	1.6
Gender	2.4	0.3	0.4	0.2	0.1
Gender of Household Head	1.0	0.3	1.2	1.5	0.5
Per Capita Income	2.2	0.4	5.8	8.8	2.1
Urban or Rural	2.0	0.4	10.8	13.6	4.2
Presence of Parents	1.0	0.4	1.5	1.7	0.2
Number of Siblings	2.5	0.2	1.2	1.6	0.4

Source: Author's calculations based on household surveys

For access to water, sanitation, and electricity, the inequality of opportunity profile is driven mainly by where a child lives (rural vs. urban residence), and to lesser extent by per capita family income. In the profile based on number of countries,

location circumstance dominates the rankings in 13 countries (out of 18) in the case of water, 12 countries in sanitation, and 16 countries (out of 17, Argentina excluded) in the case of electricity (Annex Tables A2.7-A2.9).



**Human Opportunities in a
Global Context:
Benchmarking LAC to Other
Regions of the World**

Chapter 3

Human Opportunities in a Global Context: Benchmarking LAC to Other Regions of the World

The previous chapter showed that the Latin America and the Caribbean (LAC) region has made progress in improving equality of opportunities for children to access basic goods and services, but that there still is an important challenge to achieve universality. To build consensus around the agenda ahead, in this chapter we compare Human Opportunity Indices (HOIs) in educational achievement and housing between LAC and other countries in North America and Europe. How much progress does LAC need to make to reach OECD countries minimum standards? What are the main sources of the differences between LAC and OECD countries? Are the observed differences similar across education and housing dimensions?

The chapter finds that despite gains in recent years, the gap between LAC and OECD countries in Europe and North America remains large in both education and housing HOIs. Education quality outcomes were notably worse for LAC, with even the best country scores falling below the worst scores of Europe, Canada and the US. Much of the education HOI gap is attributed to inequality of opportunity levels often two or three times higher in LAC than European and North American countries. LAC fared somewhat better

in housing indicators, with HOIs for access to sanitation and freedom from overcrowding exceeding the European average in two and three LAC countries, respectively. As with education, much of the housing HOI gap is attributed to inequality of opportunity levels often twice as high in LAC than European and North American countries.

In the case of two countries (United States and France), we exploit the availability of a long time series to draw some lessons on the evolution of the HOI over multiple decades that could be relevant to LAC. Analyzing the expansion of the HOI for housing opportunities in the US and France from the 1960s indicates that HOI levels are initially low, experience fast growth rates, and then slow down as the HOI reaches a high level.

The chapter is organized as follows. Section 3.1 describes the data underlying the construction of the HOI for educational achievement, and presents results. Section 3.2 describes the data used in constructing HOIs for access to sanitation and freedom from overcrowding, and presents results. Section 3.3 selects the longest time horizon available for two countries—the US and France—and describes how the HOI evolves over long time periods. Section 3.4 concludes.

3.1 Human Opportunity Index for Quality Education

Educational achievement measured by test scores better captures the true chances of children to meet the challenges of the future than educational attainment measured by years of schooling or even completion on time, because of considerable heterogeneity in the quality of education across schools. To some extent, educational achievement is a good proxy for the quality of schools. Therefore, to estimate the HOIs for quality education, we use data on educational achievement.

The OECD Programme for International Student Assessment (PISA) is an internationally comparable dataset on key competencies of 15 year-old students in reading, mathematics, and science. PISA assesses the degree to which students near the end of compulsory education can extrapolate from what they have learned and apply their knowledge both in school and non-school contexts, thus giving an indication of how well they have gained the skills and knowledge needed for full participation in society (OECD 2007).

Estimating the HOI for Quality Education

The HOI for quality education is built using PISA data. PISA is a triennial

survey of the knowledge and skills of 15 year-olds, originally created by the governments of OECD countries (Box 3.1). Students are tested in reading, mathematics and science. Reading literacy is measured in terms of students' abilities to use written information in situations that they encounter in their lives. Mathematical literacy measures students' abilities to pose, solve and interpret mathematical problems in a variety of situations involving quantitative, spatial, probabilistic or other mathematical concepts. Scientific literacy measures students' abilities to identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations. Students are placed in different proficiency groups according to the difficulty of tasks that they can complete. There are six proficiency groups for reading, and seven groups for mathematics and science.¹ Proficiency level 2 is usually considered the level that requires the basic tasks students need to apply the subject area in real life contexts. About 80 percent of students in OECD countries are at level 2 or above. Longitudinal follow-up studies in Australia, Canada and Denmark find that the minority of students classified either at level 1 or below are very likely to face difficulties using reading materials to fulfill their goals and to acquire knowledge (OECD 2007:46). The average for students in

¹The groups are below level 1, and levels 1 to 5 for reading, and levels 1 to 6 for science and mathematics.

OECD countries is level 3.

For the HOI for quality education, we focus on whether or not a student achieves a minimum score to place herself at proficiency level 2. Hence, the coverage rate of quality education used in the HOI is the proportion of students that took the test and achieve a score that place the student at least at proficiency level 2.

PISA surveys contain information on a common set of six circumstances: gender of the child, father's and mother's education, school location, father's

occupation, and household asset items that allows us to generate a wealth index (see Annex Table A.3.1 for more details).

We compute the HOI for quality education by estimating a logistic model on whether student i had achieved at least proficiency level 2 as a function of her or his circumstances. Based on the predicted probabilities, we compute the coverage rate, the dissimilarity index, the penalty for inequality of opportunity and the HOI, following the methodology described in Chapter 1.

Box 3.1: The PISA Data

The first PISA survey was conducted in 2000, and in 2006 the third survey included 30 OECD and 27 non-OECD countries. PISA surveys are administered in countries that together make up close to 90 percent of the world economy.²

The samples of students are nationally representative of the populations of 15 year-olds attending schools in grade 7 and above (Table 3.1). In 2006, the samples used were representative of 20 million 15 year-olds. More than 400,000 students in 57 countries took a two-hour comparable test for PISA 2006. Students also completed a questionnaire about themselves, and their principals completed a questionnaire about their schools. The samples do not cover drop outs and students attending grades below 7.

While the enrollment of 15 year-olds is generally universal in Europe, it is not so in LAC. With the exception of Portugal, all European countries considered have enrollment rates of 98 percent and above for 15 year-olds. By contrast, the proportion of 15 year-olds enrolled in the school system is as low as 61 and 63 percent in Colombia and Mexico.³ To the extent that 15 year-olds not enrolled in schools would not be able to achieve minimum expected knowledge, a low proportion of enrollment may over-estimate a national measure of the educational achievement of 15 year-olds.

²In 2009, PISA was administered in 30 OECD countries and 37 non-OECD countries/economies. Hong Kong-China is included.

³The proportion of enrolled 15 year-olds that are below 7th grade (not targeted population) is negligible in all countries, except France.

Table 3.1 Sampling and Coverage Rates (PISA 2006)

Sampling and Coverage Rates (PISA 2006)							
Country	All 15- year-olds (a)	Enrolled 15 year- olds (b)	Ratio (b)/(a)	Target population (c)	Ratio (c)/(b)	Participants	Coverage Index
Latin America							
Argentina	662,686	579,222	0.87	579,222	1.00	4,339	0.99
Brazil	3,390,471	2,374,044	0.70	2,357,355	0.99	9,295	0.99
Chile	299,426	255,459	0.85	255,393	1.00	5,235	0.99
Colombia	897,477	543,630	0.61	543,630	1.00	4,478	0.99
Mexico	2,200,916	1,383,364	0.63	1,383,364	1.00	30,971	1.00
Uruguay	52,119	40,815	0.78	40,815	1.00	4,839	1.00
Europe							
France	809,375	809,375	1.00	777,194	0.96	4,716	0.91
Germany	951,535	1,062,920	1.12	1,062,920	1.00	4,891	0.99
Italy	578,131	639,971	1.11	639,971	1.00	21,773	0.98
Norway	61,708	61,449	1.00	61,373	1.00	4,692	0.96
Portugal	115,426	100,816	0.87	100,816	1.00	5,109	0.98
Spain	439,415	436,885	0.99	436,885	1.00	19,604	0.96
Sweden	129,734	127,036	0.98	127,036	1.00	4,443	0.96
United Kingdom	779,076	767,248	0.98	767,248	1.00	13,252	0.97
North America							
Canada	426,967	428,876	1.00	424,238	0.99	22,646	0.93
USA	4,192,939	4,192,939	1.00	4,192,939	1.00	5,611	0.96

Source: PISA 2006

The Human Opportunity Index for Reading Literacy

The Human Opportunity Indices (HOI) for reading literacy in LAC countries are consistently lower than in European countries and Canada, according to findings from 16 countries from the 2006 PISA (Table 3.2).⁴ The HOI for

reading proficiency ranges from a high of 89 for Canada to a low of 35 for Argentina. Among the six Latin American countries included in PISA 2006, Chile performs best, with a HOI for reading of 58. However, even Chile is considerably below the lowest performing European country in the sample, Italy, with an HOI of 69.

⁴ Data for reading in the USA PISA 2006 is not available due to an error in the printed test booklet that distorted the results.

Table 3.2 Human Opportunity Index for Reading 2006

Human Opportunity Index for Reading, 2006				
	Coverage 2006	D-index 2006	Penalty 2006	HOI PISA (percent)
LATIN AMERICAN COUNTRIES				
Argentina	44	22	10	35
Brazil	45	20	9	36
Colombia	46	17	8	38
Mexico	53	18	10	44
Uruguay	56	15	9	47
Chile	66	12	8	58
EUROPEAN COUNTRIES				
Italy	75	8	6	69
Spain	76	8	6	70
Portugal	77	9	7	70
France	82	7	6	76
Norway	82	7	5	76
Germany	85	7	6	80
The U.K	87	5	4	82
Sweden	88	5	4	83
NORTH AMERICAN COUNTRIES				
Canada	91	3	3	89
USA	nd	nd	nd	nd

Source: Estimates produced based on PISA data, 2000 - 2006.
Canada and France don't include school location as exogenous variable

The HOI discounts the coverage rate with a penalty that is proportional to the degree of inequality of opportunity in the allocation of existing basic services. The inequality of opportunity for acquiring adequate reading in LAC countries, as measured by the D-indices, is about twice the magnitude observed in European and North American countries (Table 3.2). To reduce inequality of opportunity more effectively, policy makers need to know the inequality of opportunity profile for a given society to design effective public policies.

To build this profile, we report the specific D-indices that inform us about the inequality of opportunity associated with each specific circumstance (Table 3.3).

A profile of inequality of opportunity can be defined by the relative size of each D-index to a specific circumstance (parental income, gender, etc.).⁵ These specific D-indices represent the percentage of the available opportunity for adequate reading ability that would have to be reallocated among children for equality of opportunity to prevail, if only one circumstance were considered. For instance, if we only considered gender of child, roughly 13 percent of available opportunities for accessing adequate reading in Argentina would need to be reallocated, compared to 3.8 percent of available opportunities if we considered only father's education.

⁵ It is important to remember that the specific D-indices do not add up to the overall D-index. That is, this exercise does not have additive properties.

Table 3.3 Profile of Inequality of Opportunity: Specific D-Indices for Proficiency at Level 2 in Reading (PISA 2006)

D-Index for Proficiency at level 2 in reading, PISA 2006 (percent)

Country	Gender	School location	Father education	Mother education	Socio-Economic		Overall D-Index
					Status	Father occupation	
LATIN AMERICAN COUNTRIES							
Argentina	12.9	5.4	3.8	4.6	13.3	9.2	22.2
Brazil	9.3	4.0	5.0	4.3	11.4	7.8	20.2
Chile	3.8	3.7	2.0	3.4	5.3	3.4	12.2
Colombia	3.3	6.3	3.5	4.2	9.6	4.6	17.1
Mexico	7.7	8.9	3.1	4.2	5.1	3.4	18.0
Uruguay	8.6	2.8	2.4	5.0	7.2	4.9	15.3
EUROPE							
France	2.3		0.5	1.1	3.8	3.1	7.3
Germany	2.2	1.0	1.1	1.8	2.5	2.2	6.6
Italy	4.8	2.9	1.6	1.6	4.2	2.3	8.0
Norway	3.9	0.4	0.6	0.9	3.6	3.3	6.6
Portugal	2.8	1.3	1.5	2.6	4.5	3.8	9.1
Spain	3.4	1.0	1.1	2.1	3.7	3.5	8.1
Sweden	2.4	0.5	1.1	0.5	2.2	2.1	4.7
The U.K.	1.9	0.7	0.9	0.4	2.5	2.9	5.0
NORTH AMERICA							
Canada	1.6		0.3	0.2	1.7	1.0	2.9
Average	4.7	3.0	1.9	2.5	5.4	3.8	10.9

Source: Author's calculations based on PISA data

Overall, wealth status is the most important circumstance associated with inequality of opportunity for reading in Canada, Latin America, and European countries. It is the most important circumstance in four out of six LAC countries considered, in four out of eight European countries considered, and in Canada. However, the weight of the circumstance is much higher in Latin

America: only 1.7 percent of the available opportunities for accessing quality reading would need to be reallocated in Canada for equality of opportunity to prevail if the only circumstance considered was wealth status, compared to 13 percent in Argentina. Gender of the child is the second most important circumstance, and school location is also important in some LAC countries, notably Mexico and Colombia.

The Human Opportunity Index for Mathematical Literacy

The HOIs for mathematical literacy in LAC countries are substantially lower than in European and North American countries (Table 3.4). The HOI for mathematics ranges from a high of 90 for Canada to a low of 18 for Argentina.

Among the six Latin American countries included in PISA 2006, Uruguay is the best-performing country, with an HOI for mathematics of 47. However, even Uruguay is considerably below the lowest performing European country in our sample, Italy (63), as well as compared to the US (69), the low performer in North America.

Table 3.4 Human Opportunity Index for Mathematics (PISA 2006)

Human Opportunity Index for Mathematics, 2006				
	Coverage 2006	D-index 2006	Penalty 2006	HOI Math 2006
LATIN AMERICAN COUNTRIES				
Brazil	27	32	9	18
Colombia	28	27	8	20
Argentina	37	25	9	28
Mexico	43	20	9	34
Chile	45	23	11	35
Uruguay	56	15	9	47
EUROPEAN COUNTRIES				
Italy	69	9	6	63
Portugal	71	10	7	64
Spain	77	7	6	72
France	82	7	6	76
Norway	81	6	4	77
Sweden	84	5	5	80
Germany	85	6	5	80
The U.K	86	5	5	81
NORTH AMERICAN COUNTRIES				
Canada	92	2	2	90
USA	75	8	6	69

Source: Estimates produced based on PISA data, 2000 - 2006.
Canada and France don't include school location as exogenous variable

Wealth status is the circumstance most strongly associated with inequality of opportunity for accessing quality education in mathematics in Latin America and Europe (Table 3.5). It is the

most important circumstance in five out of six LAC countries considered and in seven out of eight European countries considered. Father's occupation is the second most important circumstance.

Table 3.5 Profile of Inequality of Opportunity: Specific D-Indices for Proficiency at level 2 in Mathematics (PISA 2006)

D-Index for Proficiency at level 2 in mathematics, PISA 2006 (percent)

Country	Gender	School location	Father education	Mother education	Socio-Economic Status	Father occupation	Overall D-Index
LATIN AMERICAN COUNTRIES							
Argentina	3.2	7.6	6.0	5.6	17.3	8.5	25.5
Brazil	6.8	5.4	8.2	9.2	19.7	11.1	31.7
Chile	7.2	4.9	4.8	8.7	9.8	8.4	23.2
Colombia	11.4	6.2	5.6	6.4	16.5	10.8	27.4
Mexico	3.6	10.8	2.7	7.3	6.1	4.2	20.4
Uruguay	1.7	3.5	3.2	6.0	7.8	4.5	15.4
EUROPE							
France	0.5		1.4	1.8	4.0	3.2	7.4
Germany	1.1	0.9	0.9	1.6	3.2	2.5	6.2
Italy	2.2	2.8	1.3	1.6	5.4	3.2	8.8
Norway	0.6	0.7	0.9	0.9	3.6	3.3	5.5
Portugal	1.5	1.8	3.2	2.7	5.4	5.3	10.2
Spain	0.4	0.5	0.7	2.1	4.0	3.5	7.2
Sweden	0.4	0.4	1.7	0.8	2.4	3.4	5.4
The U.K.	0.8	0.9	1.4	0.6	3.1	2.7	5.3
NORTH AMERICA							
USA	0.9	2.9	0.4	1.2	3.3	5.0	8.4
Canada	0.3		0.2	0.2	1.4	1.3	2.1
Average	2.7	3.5	2.7	3.6	7.1	5.0	13.1

Source: Author's calculations based on PISA data

The Human Opportunity Index for Science Literacy

The HOIs for science literacy in LAC countries are also substantially lower than in European and North American countries (Table 3.6). Scores range from 90 for Canada to 30 for Brazil. Among the

six Latin American countries included in PISA 2006, Chile is the best-performing country with a HOI for science of 53. However, even Chile is considerably below the lowest performing European countries in our sample, Italy and Portugal, with HOIs of 71.

Table 3.6 Human Opportunity Index for Science (PISA 2006)

Human Opportunity Index for Science, 2006				
	Coverage 2006	D-index 2006	Penalty 2006	PISA 2006 (percent)
LATIN AMERICAN COUNTRIES				
Brazil	40	24	9	30
Colombia	40	18	7	33
Argentina	46	22	10	36
Mexico	49	19	9	40
Uruguay	60	14	8	51
Chile	62	14	9	53
EUROPEAN COUNTRIES				
Italy	76	7	6	71
Portugal	78	8	6	71
France	83	7	6	77
Spain	82	6	5	78
Norway	83	5	4	78
Sweden	86	4	4	83
Germany	88	5	4	84
The U.K	88	4	4	84
NORTH AMERICAN COUNTRIES				
USA	79	8	6	73
Canada	92	2	2	90

Source: Estimates produced based on PISA data, 2000 - 2006.
Canada and France don't include school location as exogenous variable

Wealth status, again, is the circumstance most strongly associated with inequality of opportunity for accessing quality education in science in Latin America (Table 3.7). It is the most

important circumstance in five out of six LAC countries considered. Father's occupation is the second most important circumstance.

Table 3.7 Profile of Inequality of Opportunity: Specific D-Indices for Proficiency at level 2 in Science (PISA 2006)

D-Index for Proficiency at level 2 in science, PISA 2006 (percent)

Country	Gender	School location	Father education	Mother education	Socio-Economic Status	Father occupation	Overall D-Index
LATIN AMERICAN COUNTRIES							
Argentina	3.3	6.3	4.6	6.5	13.9	8.1	22.0
Brazil	2.6	5.3	4.5	7.2	14.8	9.3	23.7
Chile	2.8	3.0	3.4	4.5	5.5	3.6	13.8
Colombia	4.1	4.3	2.7	4.1	10.6	6.9	18.0
Mexico	1.9	10.5	3.0	5.0	5.8	4.1	19.0
Uruguay	2.3	2.3	3.9	4.2	6.5	4.1	13.8
EUROPE							
France	0.0		0.9	1.4	3.7	3.1	7.1
Germany	0.4	0.9	0.7	1.3	1.9	1.9	5.0
Italy	0.4	2.4	1.6	1.4	4.5	2.5	7.3
Norway	0.5	1.0	0.5	1.0	3.4	2.9	5.1
Portugal	0.2	0.7	2.0	2.5	4.0	4.3	8.0
Spain	0.2	0.6	0.7	1.8	2.6	2.6	5.7
Sweden	0.3	0.3	1.3	0.9	1.7	2.8	4.2
The U.K.	0.0	0.5	1.0	0.5	2.4	2.4	4.5
NORTH AMERICA							
USA	0.8	2.9	0.5	0.9	3.0	4.3	7.6
Canada	0.2		0.4	0.3	1.3	1.1	2.2
Average	1.3	2.9	2.1	2.9	5.6	4.2	11.0

Source: Author's calculations based on PISA data

3.2 Human Opportunity Index for Housing

In this section we examine how LAC countries compare to other regions around the world on access to sanitation and the degree of overcrowding within the home. While the importance of access to sanitation has been underscored in Chapter 1, the importance of overcrowded housing bears discussion here.

Evidence on the negative impact of overcrowding based on clear causal relationships has been compiled in a number of studies around the world. This ranges from evidence on the link between mental health and overcrowding in Thailand (Fuller et al., 1993) to evidence that relationships between parents and children suffer in overcrowded settings in the US (Gove et al., 1979). Studies have examined the link between overcrowding and the likelihood of being exposed to unhygienic conditions and the causal link between overcrowding and educational attainment and progress (Coggan et al., 1993; Currie and Yelowitz, 2000; and Goux and Maurin, 2005). This confluence of evidence has led some countries to develop statutory overcrowding standards (UK) and others to develop targeting indicators

to monitor the proportion of households living in overcrowded conditions (US). Due to the growing awareness of its importance, this study compares freedom from severe overcrowding among different countries.

The Data

For non-LAC countries, we use census micro-samples from the Integrated Public Use Microdata Series (IPUMS) International databases. The IPUMS data contains information on access to sanitation services. Data also include the gender of the child, the gender of the head of the household, urban or rural residence, number of siblings, whether or not the child lives with both parents, and the completed education level of the head of the household. Since total household income was not comparable across samples, this circumstance variable was excluded.⁶ Because these are samples of the census data, all calculations were weighted (see Annex Table A.3.3 for more details). For LAC countries, we use the harmonized household surveys from the SEDLAC database described in Chapter 2. Severe overcrowding is generally considered to exist when there are more than 1.5 people per room on average

⁶ When data were available, a series of variables for assets owned by the household were included. The annex reports results both with and without information on asset ownership as a measure of wealth.

(although the US considers overcrowding any level above one person per room). By combining IPUMS data on number of rooms with information on the number of people in the household, we derive the number of people per room to use in the overcrowding HOI.

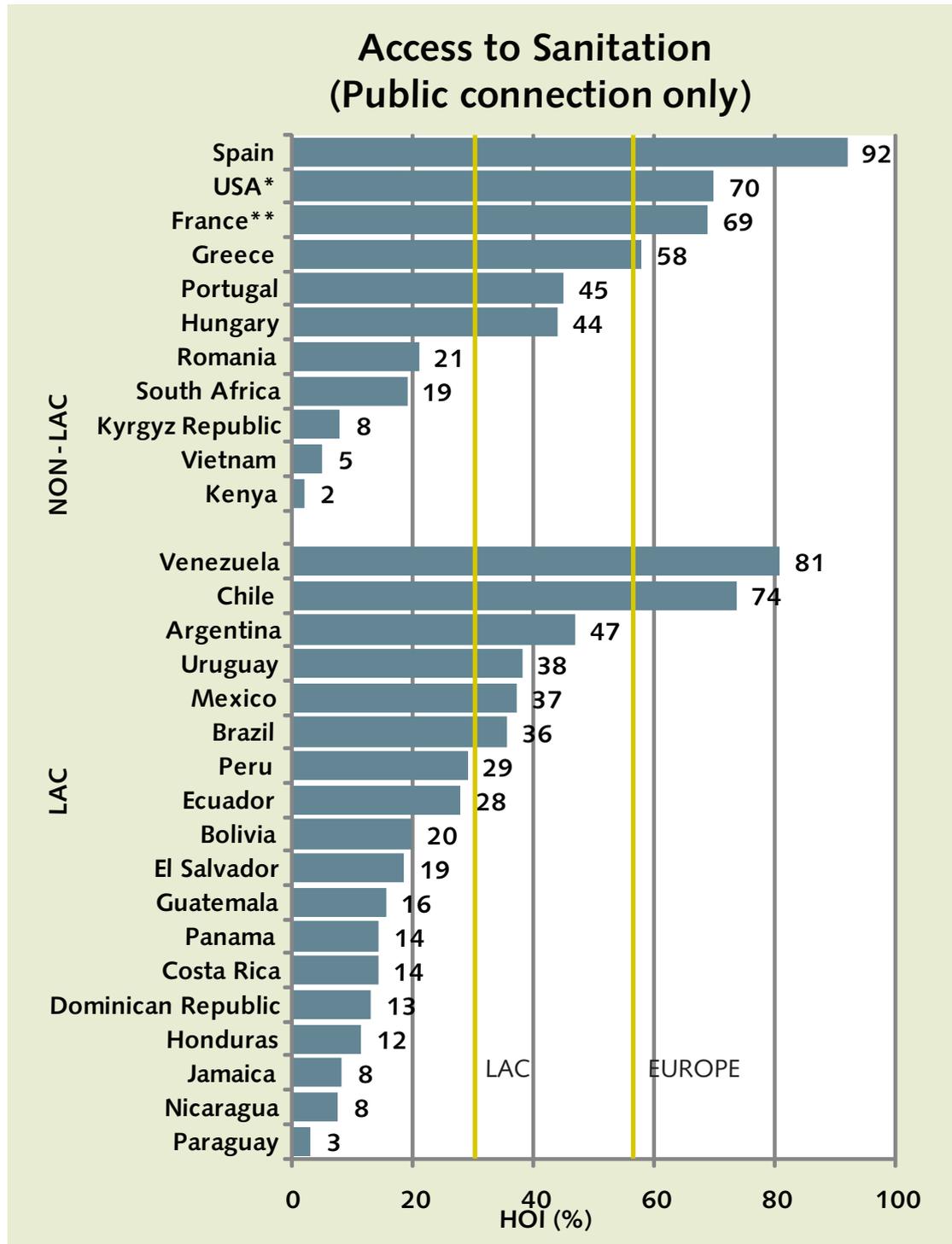
The Human Opportunity Index for Sanitation

When only access to a public sanitation connection is considered, the majority of LAC countries we analyzed were below the average for all available European countries of approximately 60 (Figure

3.1). Only two LAC countries, Venezuela (81) and Chile (74), report HOI levels above the European average. When the definition is broadened to include septic tanks, five countries are above the European average (Figure 3.2). The remaining countries also improve when considering septic systems, but remain below the average of the European countries.⁷ Much of the sanitation HOI gap is attributed to inequality of opportunity levels approximately twice as high in LAC than European and North American countries when considering septic systems (Tables A3.5 A-B).

⁷ Annex Table 3.4A reports the results from the most recent round of household surveys analyzed in Chapter 2. Annex Table 3.4B complements these results using data from censuses available in the IPUMS database.

Figure 3.1: HOI Sanitation

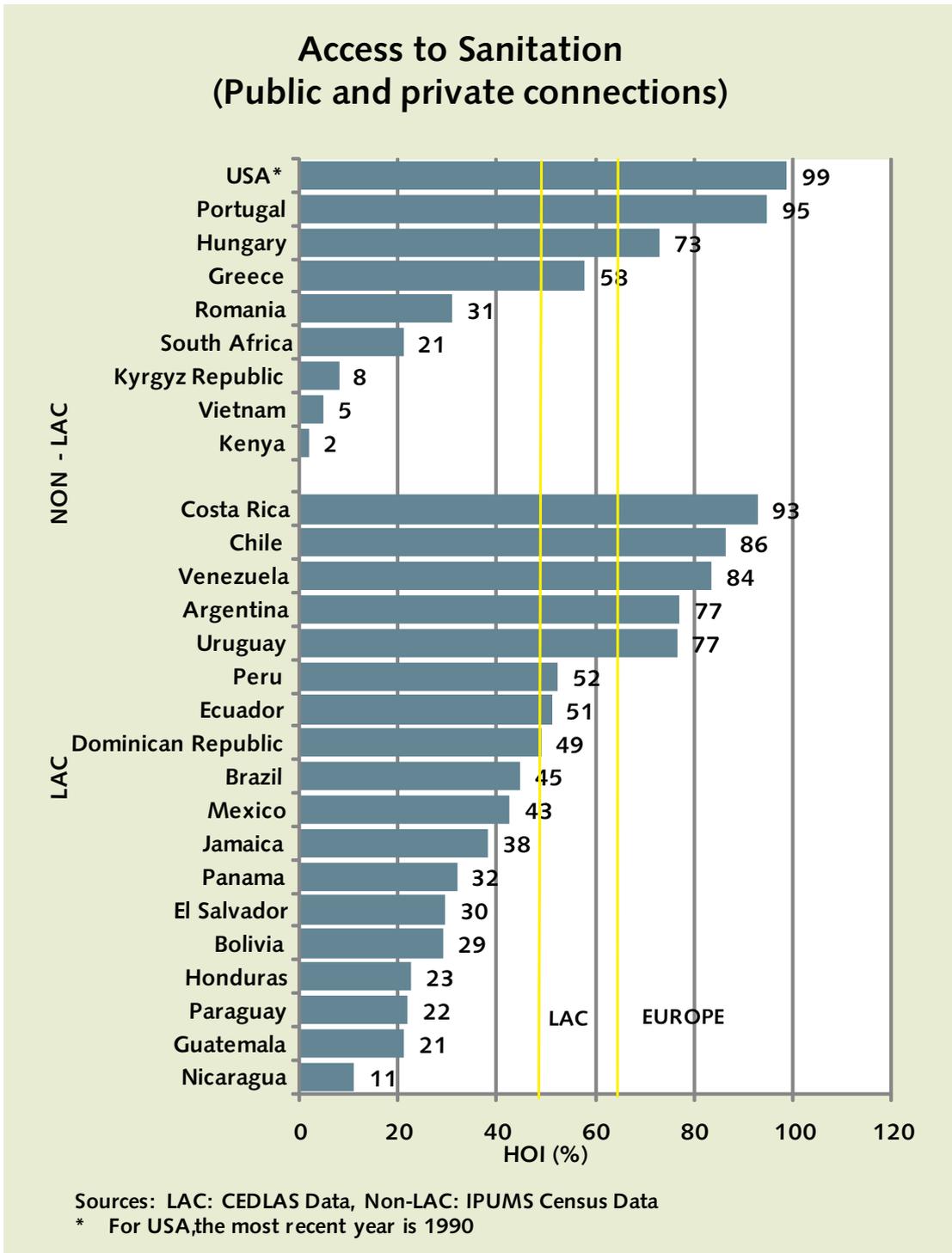


Sources: LAC: CEDLAS Data, Non-LAC: IPUMS Census Data

* For USA, the most recent year is 1990

** For France, the most recent year is 1982

Figure 3.2: HOI Sanitation (Public + Septic Tank)

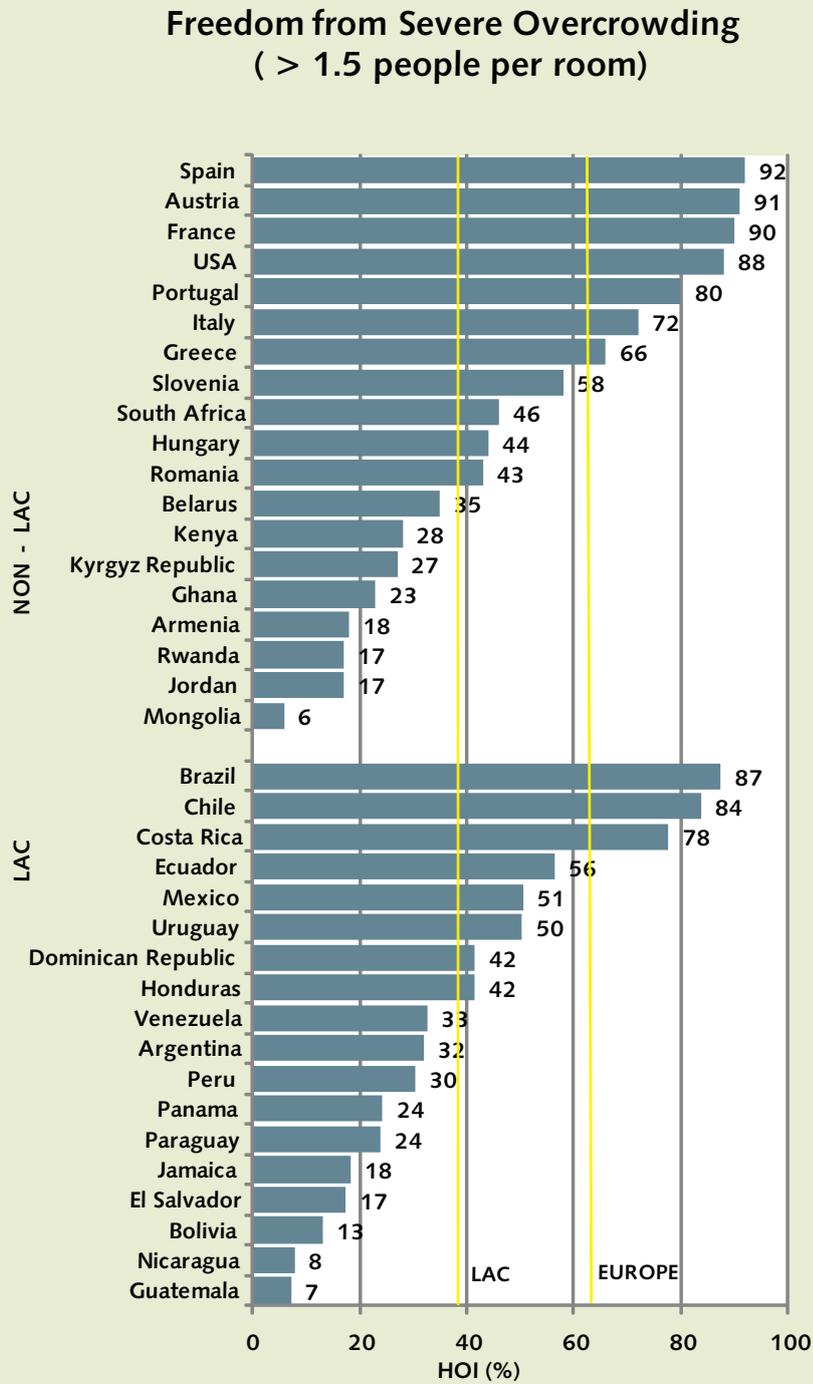


Human Opportunity Index for Freedom from Severe Overcrowding

The mean value of the freedom from severe overcrowding HOI in European countries is 60. Only three LAC countries are above this value—Brazil (87), Chile (84) and Costa Rica (78). The remaining countries are five or more percentage points below the mean (Figure 3.3). In Spain—the highest scorer in this

HOI—92 percent of the opportunities for access to overcrowded homes needed for universality are available and equitably distributed, compared to only 30 percent in Peru. Much of the freedom from severe overcrowding HOI gap is attributed to inequality of opportunity levels more than twice as high in LAC than European and North American countries (Tables A3.6 A-B)

Figure 3.3. HOI Freedom from Severe Overcrowding



3.3 Understanding the Long-run Evolution of the HOI

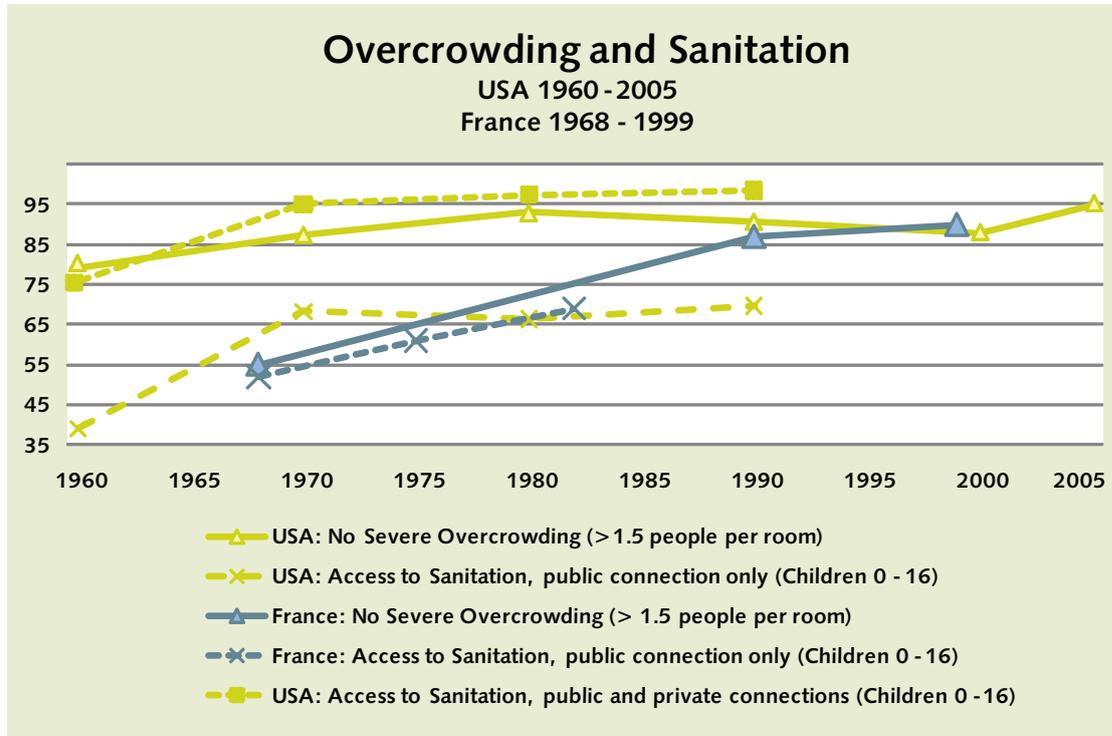
The IPUMS-International database contains information on multiple rounds of census data for several countries. The longest two time series available and analyzable were from the US and France. This section exploits that time series by exploring the long-run evolution of the housing and sanitation HOI in these two countries. For the US, data is available from each decennial census from 1960 to 2000, and then in 2005 data from the American Community Survey is used. In the case of France, the data are less consistently available though they span an equally long time period.

The long-run evolution of the HOI for Severe Overcrowding

Over the past 45 years, the US's HOI for freedom from severe overcrowding has improved by roughly 15 points (Figure 3.4). The HOI improved rapidly in the first part of the period analyzed, and then growth slowed as the HOI approached universality (Annex Table A.3.8). This might be in line with a notion that the last unit of a good or service is more costly to provide than the first.⁸ The freedom from overcrowding HOI in France began from a much lower base than in the US, but improved much more quickly over a shorter period of time—from about 55 in 1968 to about 87 in 1999. Similar to the US, improvements slowed as the HOI reached higher levels.

⁸ This slowing down of the HOI growth rate as approach to universality would imply in most cases that the actual arrival time to universality would be slower than what a linear growth assumption would suggest. In light with this finding, the arrival time to universality in LAC discussed in Chapter 2 should be consider as "optimist" projections of the LAC expected trend.

Figure 3.4: HOI Overcrowding and Sanitation



Note: We report all available data in this figure. Data are not available to compute access to septic tanks for France (see annex for details).

The long-run evolution of the HOI for Adequate Sanitation

The HOI of access to adequate sanitation (public system only) shows much more similar values in US and France than the overcrowding index, although improvement in the US stagnates after 1970 while France shows steady growth. However the French time series for this HOI is much shorter, making direct comparisons difficult. Including septic systems into the calculation brings the US HOI up to near universality after 1970,

but no data were available in France on septic systems to make a comparison. As with overcrowding, both countries showed faster growth rates when the HOI was low, with progress slowing as the HOI increases. For instance, for the USA while in 1960 the HOI for sanitation (public system + septic tanks) grew roughly 2 points per year between 1960 and 1970, but then only 0.3 points per year in 1970-1980 and 0.1 points in 1980-1990 (see Annex Table A.3.7 for more details).

3.4 Conclusion

The analysis in this chapter illustrates that LAC countries still need to make significant progress to achieve the levels of equal opportunity most OECD countries have achieved in the provision of basic services. This is particularly true regarding the quality of education, where LAC countries all score below even the lowest-achieving countries in Europe and North America. Housing HOIs are also below European averages, but in this case some LAC countries have reached and even exceeded the median European HOI scores.

Despite gains in educational outcomes, the gap between the education HOI in LAC and Europe and North America remains large. All LAC countries included in this study have a lower HOI than any of the countries analyzed in Europe and North America on opportunities for accessing quality education. The countries with the highest HOIs for reading, mathematics and science in LAC are considerably behind the countries with the lowest performance in Europe and North America. Much of the overall education HOI gap is attributed to inequality of opportunity levels often two or three times higher in LAC than European and North American countries. Wealth status is the circumstance most strongly associated with inequality of opportunity in reading, mathematics and science in LAC countries.

The results on housing cover two areas relevant for policy makers: access to sanitation and freedom from severe overcrowding. Only two of 18 LAC countries analyzed were above the average for European countries in access to sanitation via a public connection, and only five were above the European average when the definition included septic tanks. The average value of the freedom from overcrowding HOI was 60 among European countries. Only three LAC countries—Costa Rica, Chile and Brazil—are above this value, with the remaining countries five or more points below.

Analyzing the expansion of the HOI for housing opportunities in the US and France from the 1960s indicates that HOI levels are initially low, experience fast growth rates, and then slow down as the HOI reaches a high level. This suggests that LAC countries may follow a similar pattern—achieving strong gains in the equitable provision of basic services earlier in the development process, and then slowing down as countries come close to universal provision. The evidence from Chapter 2 on trends in LAC over time coincides with this finding in certain respects.

This chapter underscores that the current generation of children in Latin America have fewer opportunities of accessing key goods and services than their counterparts in Europe and North America, and that existing opportunities

are distributed less equitably. Endowed with these more limited opportunities, the literature suggests that it will be more difficult for these children to enjoy psychological and physical good health as children and to be motivated and equipped to pursue their interests and

reach their potential as adults. This suggests important barriers remain in all regions analyzed, but particularly in Latin America, to ensure that the next generation of children faces a level playing field in obtaining opportunities needed to develop themselves.

Chapter

4



**Human Opportunities
at the Sub-national Level
in Latin America
and the Caribbean**

Human Opportunities at the Sub-national Level in Latin America and the Caribbean

Spatial inequalities—both in terms of outcomes, such as income and poverty, and in access to critical opportunities—have received considerable attention in the literature. Not only do spatial inequalities remain marked, but they have the potential to create significant political tensions and they present an actionable policy challenge.

This chapter explores inequalities in the HOI at the sub-national level (region, province, department or state) in Latin America and the Caribbean (LAC). The chapter also analyzes whether the dispersion of sub-national HOIs grows or decreases with the level of the HOI and the structure of government (degree of decentralization), and outlines possible fiscal instruments which can be used to accelerate equality of opportunities across sub-national regions.

Not surprisingly, the chapter discovers significant heterogeneity in sub-national opportunities across time, countries, and the specific opportunity dimensions analyzed. It presents some stylized facts on overall equality of opportunities at the sub-national level as well as on access to housing and education opportunities. The analysis shows convergence between states with high and low initial HOI levels, albeit at a rather slow pace. This convergence appears more in

educational opportunities compared to opportunities to access quality housing. This chapter is organized as follows. Section 4.1 describes the main findings regarding sub-regional HOIs across countries. It considers stylized facts for housing and education opportunities across the top and bottom-ranked sub-national regions. Section 4.2 analyzes different measures of dispersion of sub-national HOIs and how dispersion may relate to different national and regional policies, most notably the degree of political and fiscal decentralization. Section 4.3 discusses possible ways to equalize opportunities across regions, supporting the World Development Report 2009 message that opportunities should be equalized by leveling the playing field, rather than by seeking uniformity in outcomes. Section 4.4 offers concluding remarks.

4.1. The Sub-national Human Opportunity Indices: Some Stylized Facts

A series of sub-national Human Opportunity Indices (SN HOIs) is estimated using data from 30 household surveys for 15 LAC countries over a period of more than a decade (1995-2009). The analysis employs the same

basic services, circumstances and overall methodology as the national indices in Chapter 2. Together, the surveys represent roughly 165 sub-national governments from 15 LAC countries (Annex Table A4.1 and A4.2).¹

The analysis finds significant heterogeneity in children's access to basic services across sub-regions or sub-national governments in the countries considered, with a much wider range than between overall national-level HOIs.² The spread extends from a high of 96 for Tierra del Fuego in Argentina to lows of 29 in the Atlantic Region, Nicaragua and 31 in Morazán, El Salvador.

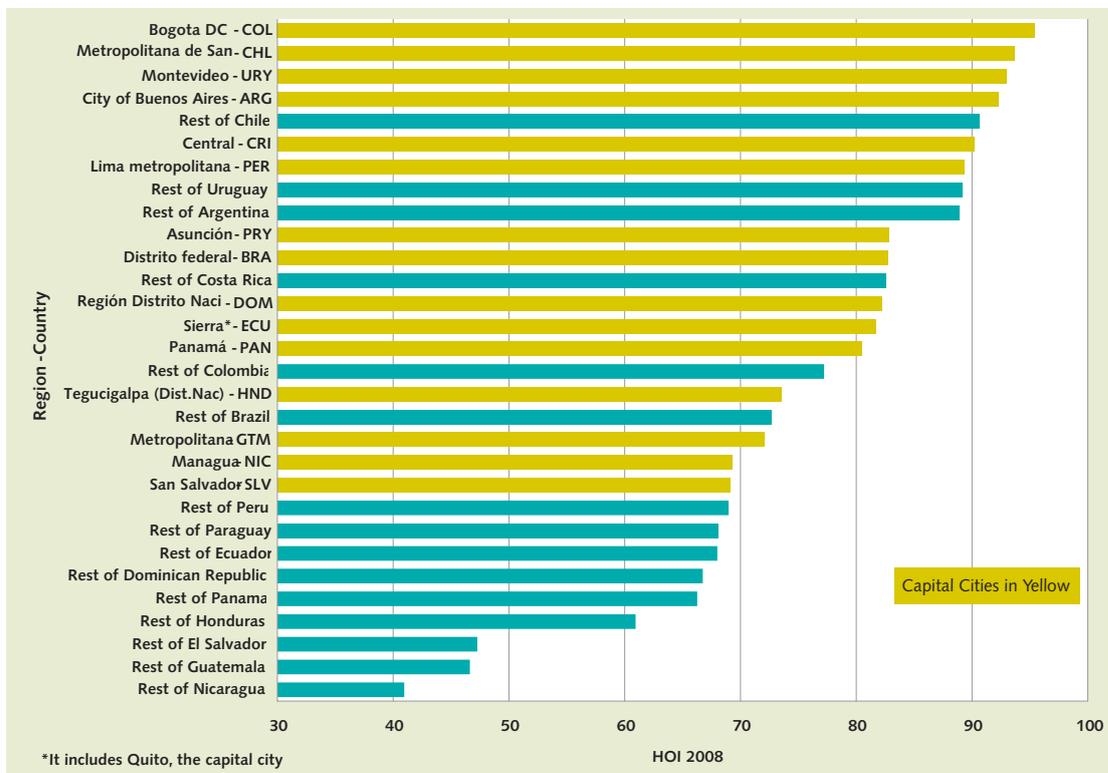
The ranking of sub-national regions is roughly similar to the national ranking by HOI. Chile and Uruguay are the top countries in terms of the national HOI. Of the 165 provinces considered, the first 50 provinces include 18 from Uruguay, 16 from Argentina, 11 from Chile, three from Colombia, one from Peru and one from Costa Rica. All except one of Uruguay's provinces (95 percent) are among the top 50, Chile has 85 percent (all except two), Argentina 70 percent, while Colombia has only 30 percent (three out of nine provinces).³ Similarly, the lowest-ranked SN HOIs tend to come from the countries with

the lowest national HOI scores. All the regions of El Salvador, Nicaragua and Guatemala are included in the 50 lowest-ranked SN HOIs, except for their capital cities (Annex Table A4.2). Uniquely, Peru has regions both in the top 50 and bottom 50 provinces: one in the top and three in the bottom. More than 60 percent of the sub-regions of Honduras, Panama, Ecuador and Brazil are in the middle ranking, and the rest in the bottom. They seem to be in the "lower-middle class" in terms of provincial distribution among this group of countries. On the other hand, Colombia and Costa Rica also have more than 60 percent of their SNs in the middle with the rest in the top, hence are more "upper-middle class." Colombia and Brazil, two of the most unequal countries in the region in terms of income inequality and regional income disparities, do not appear so unequal in terms of the spatial distribution of opportunities.⁴

Opportunities to access basic goods and services are systematically higher in the capital cities. Comparing the overall HOI by capital city and the rest of the country, Bogotá, Santiago, Buenos Aires and Montevideo are the top-ranked, and all capital cities provide more opportunities than other areas of their countries (Figure 4.1).⁵

¹The heterogeneity in the data is corrected to the extent possible in next sections. A sensitivity analysis of the results was done by grouping all the countries by region and not by province. Although there are some minor changes that will be noted in next sections, most conclusions remain unchanged.

Figure 4.1: Overall HOI Circa 2008 by Main City and Rest of the Country



² In this chapter the terms regional, sub-national, provincial or state government are used interchangeably unless specified, for example between provinces and municipalities, which are clearly two different government levels. Some of the countries analyzed in Chapter 2 did not have representative data at any regional or sub-national level and hence were dropped from this analysis (see Annex Table A4.1). This is the case of Bolivia, Jamaica, Mexico and Venezuela. Among the 15 remaining countries, seven—Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Nicaragua and Peru—could not be analyzed by province or department since the data was not representative at that level of analysis, and hence regional data was divided into economic or natural regions by the respective national statistics institutes. The rest of the countries were divided across provinces or departments. However, in some cases, like Paraguay, the departments included may not cover all the national territory and population, since their sample size was not sufficiently high to estimate the HOI. The standard error of the sub-national HOIs is much larger than that of the national HOIs, since their sample size is obviously much smaller. In this respect, the ranking among sub-national HOIs should be analyzed with care.

³ This analysis is not strict, not only because of heterogeneity in the definition of sub-regions but also in that countries have different numbers of SNs, whatever the definition used. Nonetheless, the comparisons are revealing.

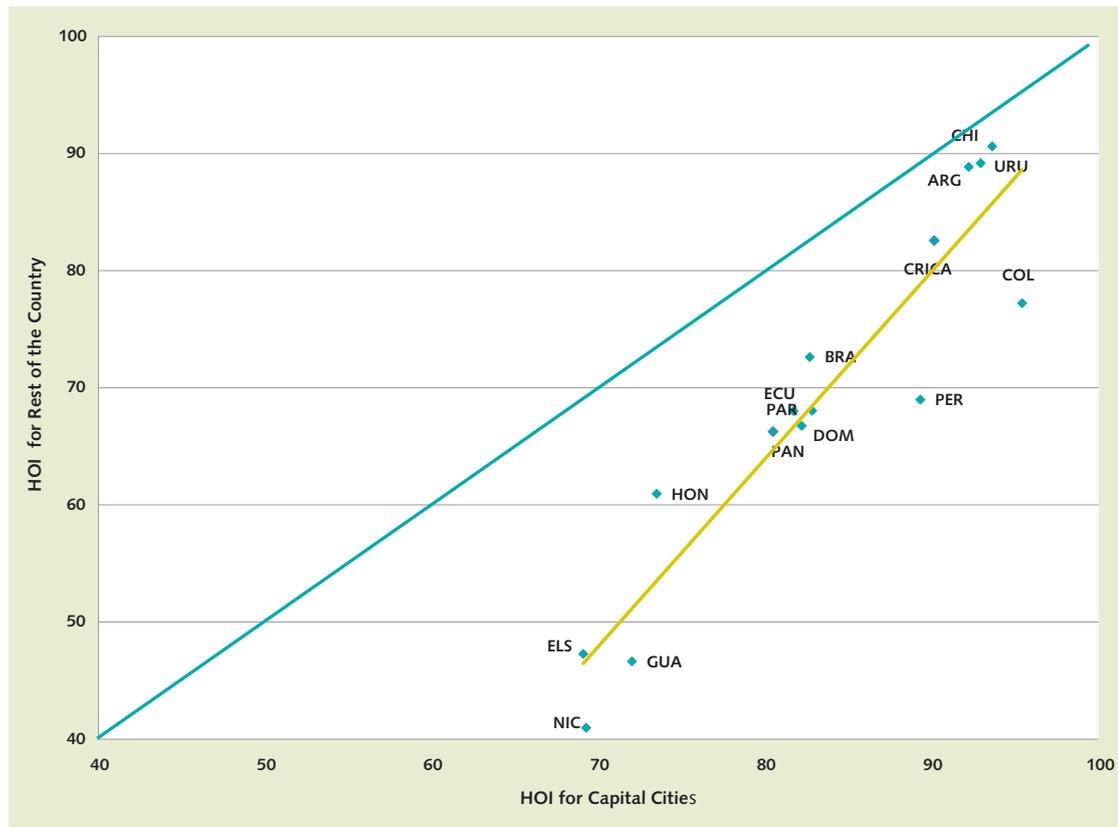
⁴ According to the latest data available in World Development Indicators 2009, the Gini coefficient for per capita income was 55 for Brazil in 2007 and 58.5 for Colombia in 2006. ECLAC (2008) classifies Brazil and Colombia within the “high inequality” countries in LAC together with Bolivia, Honduras and Guatemala. It also notes that while Brazil income inequality decreased in the 2000s, the opposite occurred in Colombia. With respect to regional inequality, Herrán (2005) found that in 2000 in Brazil, 24 percent of income inequality was explained by regional differences, while 76 percent was due to household-specific characteristics. Colombia, in spite of perceptions of high regional disparities in income (measured by GNP), is not highly unequal as measured by the HOI, but rather moderate compared internationally. However, it does not show convergence among its regions nor policies to diminish regional inequalities.

⁵ Comparisons between the capital city and the rest of the country reflect in part the wide differences between urban and rural HOIs, but also the high disparities in LAC between main capital cities—usually mega cities, modern, but with important agglomeration of inhabitants, migrants, and slums, and economic activity centralized around the metropolitan area—and other “provincial” cities.

Among the lower-ranked countries, the gap is greater between the capital cities and the rest of the nation (Figure 4.2). Not only are the HOIs of the capital cities higher than the rest of

their respective countries, but also the higher the HOI, the lower the gap in opportunities between capital and the rest of the country.

Figure 4.2: HOI Circa 2008 by Main City and Rest of the Country



Note: The fact that capital city HOIs are below the 45 degree line indicates that they have higher HOI scores than the rest of the country.

Disaggregating SN HOIs by education and housing opportunities shows that access to opportunities is more uneven for housing than for education (Figures 4.3 and 4.4). It also reveals that the gap

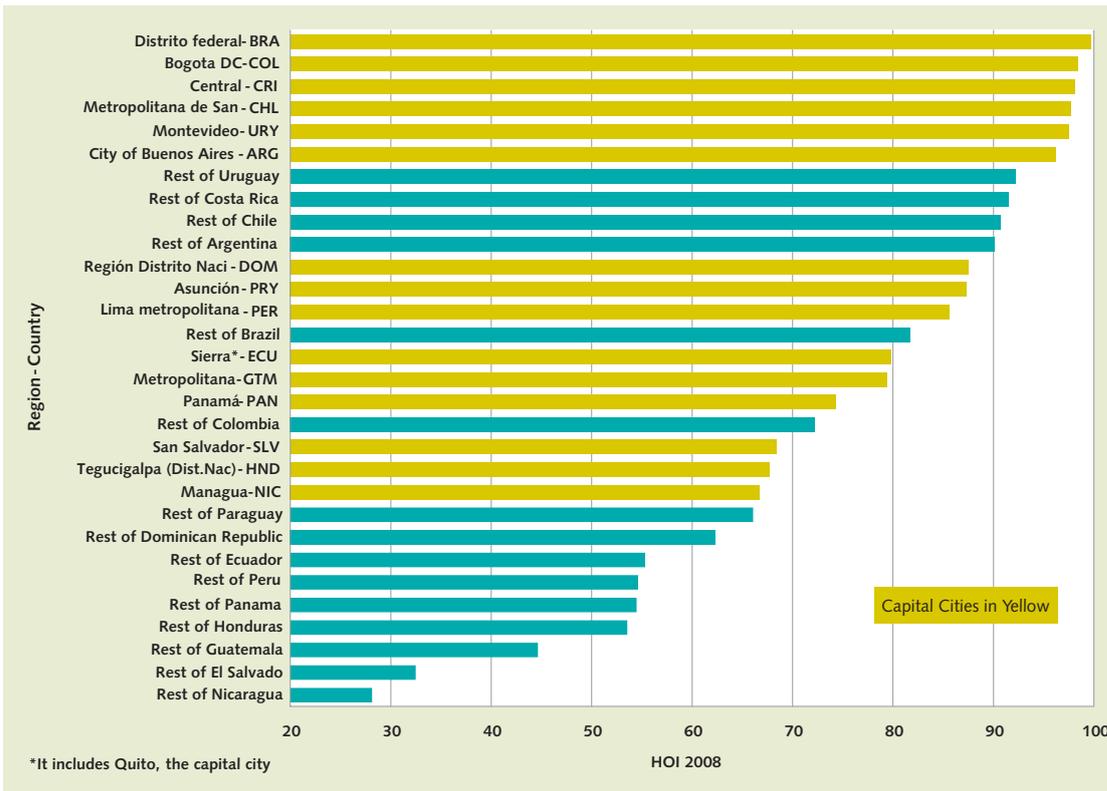
between capital cities and the rest of the country is greater for housing than for education. The relative ranking of capital cities does not perfectly match the overall national HOI ranking. The

capitals of Brazil, Colombia have the highest rankings for housing, while the capitals of Colombia and Peru have the highest ranking for education, despite the fact that these are not the top countries in the national HOIs.⁶

The dispersion of SN HOI scores for education and housing do not necessarily follow similar patterns. While Peru has relatively higher HOIs for education across sub-national regions (the areas

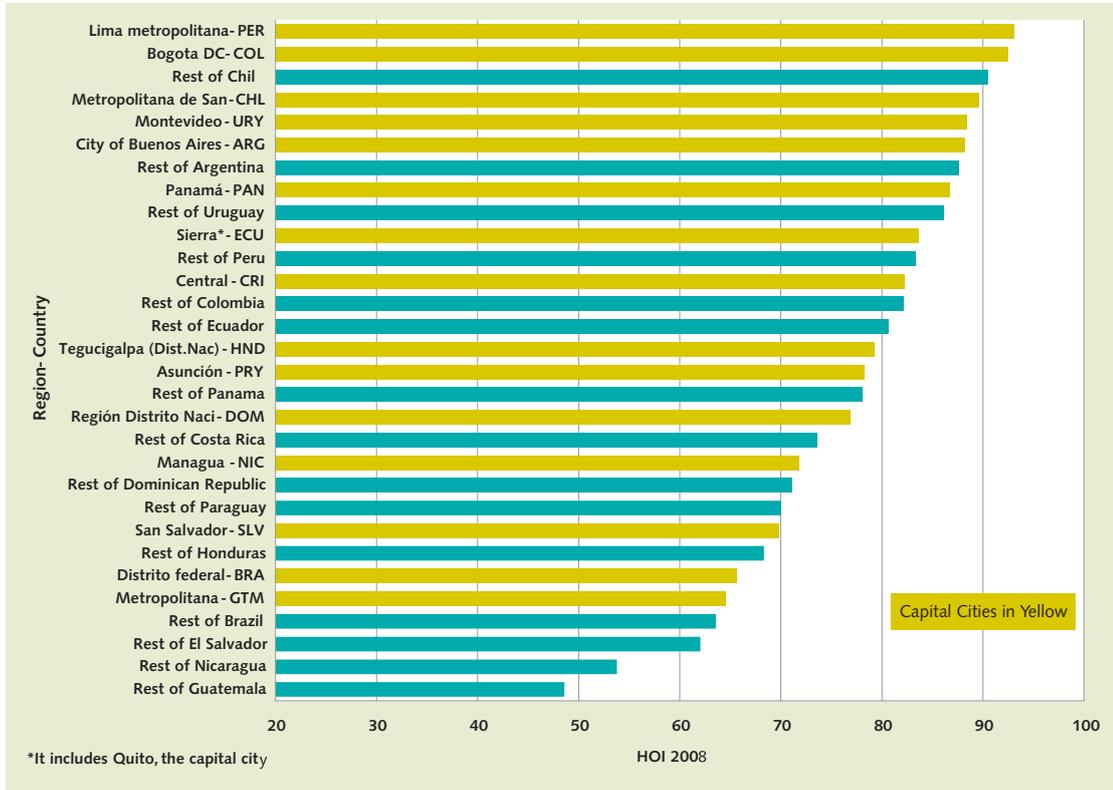
outside of Lima score in the top third of the HOI for education), it has low HOIs for housing outside of Lima (Figures 4.3 and 4.4). In Brazil, HOIs are lower in education, but the gap between the capital city and the rest of the country is greater for housing: the HOI for education in the capital is 65, and in the rest of the country it is 64; while the housing HOI is 99 for Brasilia and 82 for the rest of Brazil.

Figure 4.3:
HOI in Housing Circa 2008 for Capital City and the Rest of the Country



⁶ Brasilia might rank top because of its relatively "new" status as capital. Nonetheless, the same ranking holds if Rio de Janeiro or São Paulo are used (with housing HOI of 95 and 97 percent respectively).

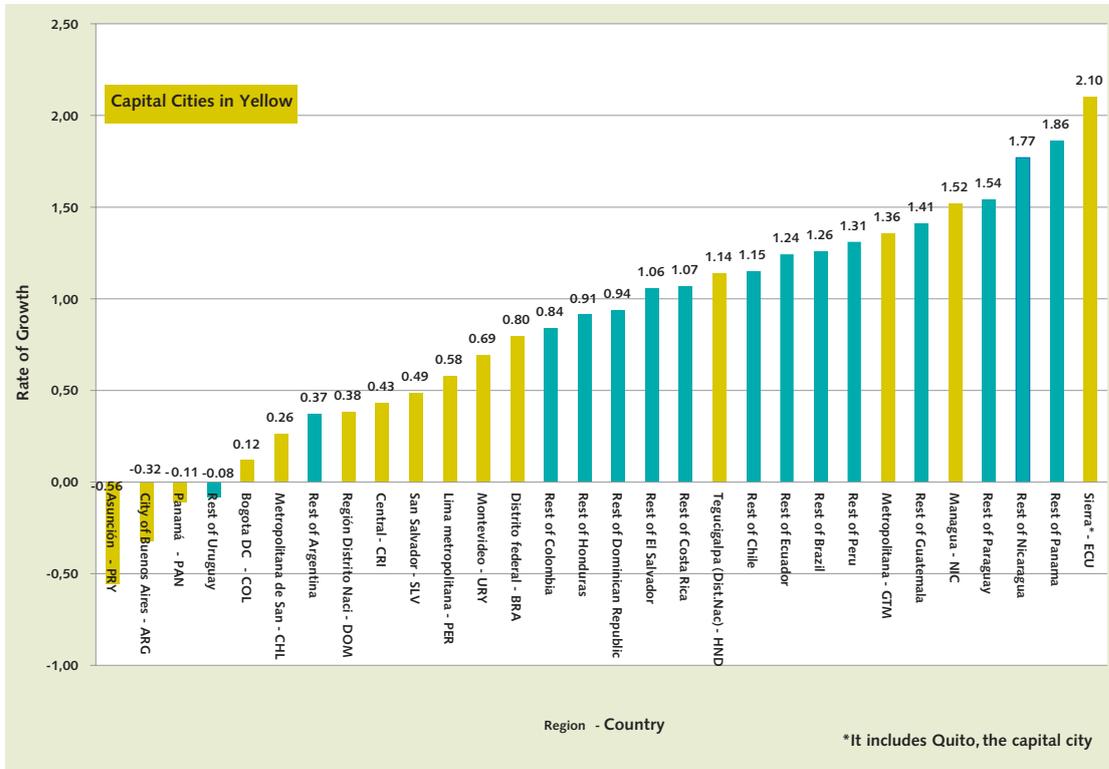
Figure 4.4:
HOI in Education Circa 2008 for the Capital City and the Rest of the Country



There is some evidence of a decreasing gap over time between capital cities and other areas of the country for access to basic services, as well as an overall convergence in levels among the sub-national regions. Comparing annual overall HOI growth from the mid-1990s to 2008 between capital cities and the areas outside the capital city suggests that in general the highest increases in the overall HOIs were attained outside the capital cities, and in particular in areas that had lower services in the mid-1990s (Figure 4.5). In the approximately

13 years considered, seven out of the ten greatest improvement in the HOIs were experienced by the areas outside the capitals of Panama, Nicaragua, Paraguay, Guatemala, Peru Brazil, and Ecuador. Among the ten lowest growth areas, seven are capital cities—Buenos Aires, Panamá, Asunción, Bogotá, Santiago, San José and San Salvador.⁷ Plotting the overall HOI growth rate against the HOI in levels indicates convergence of opportunities across sub-national regions (Figure 4.6). The results reveal that the higher the HOI, the lower the rate of change.⁸

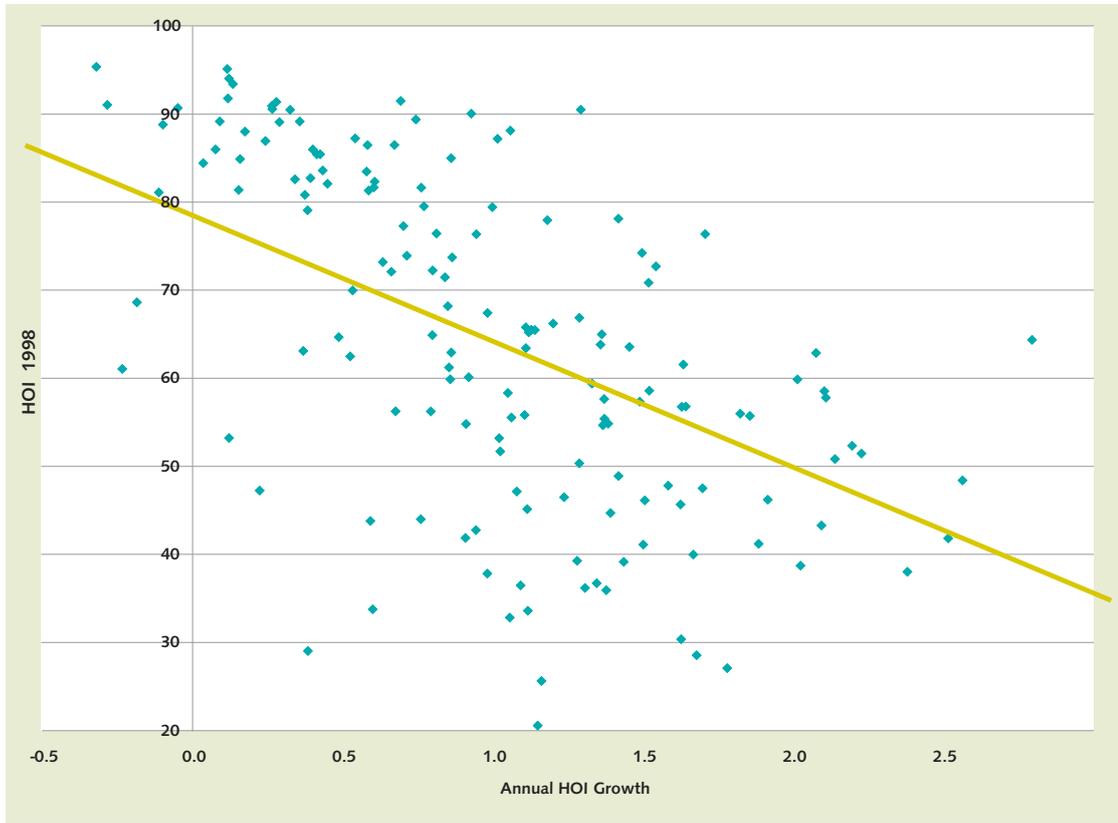
Figure 4.5:
Annual Growth of HOI Between Circa 1995 and 2008: Capital Cities vs. Rest of Country



⁷ The decrease in the annual growth in services in some of the cities should be interpreted with care. The sample size and some problems with the comparability of the data, especially in the case of Paraguay and Argentina, might be driving the negative result. Most likely the rate of growth in these capitals should be close to zero.

⁸ A simple OLS regression of the 165 SN HOIs rate of growth and the HOIs estimates a coefficient of -.015 and a t-statistic of -4.67, showing the coefficient to be statistically significant in explaining that regions with more limited opportunities grow on average at faster rates than higher ranked regions.

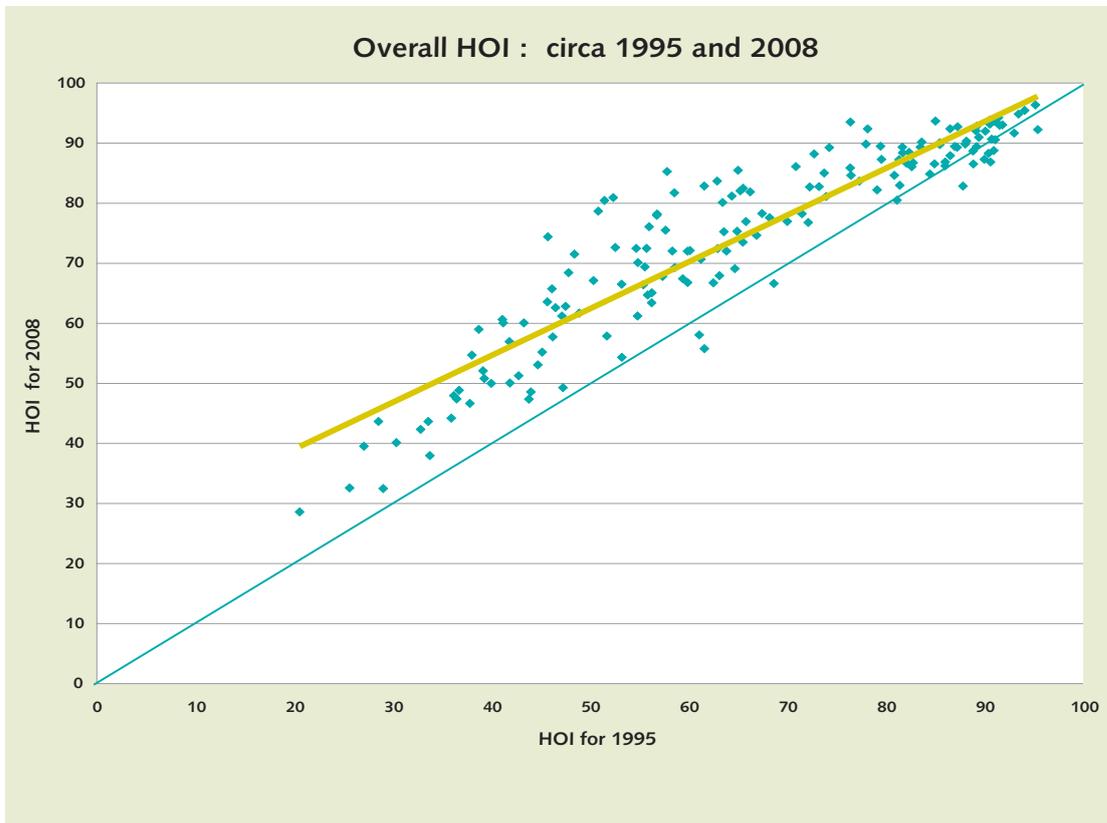
Figure 4.6: Annual Growth of HOI Between Circa 1995 and 2008



Further evidence for convergence can be found in graphing the HOI circa 1995 against the HOI circa 2008: the trend line is flatter than 45 percent, suggesting that the rate of change was smaller for

regions with a higher HOI in 2008 (Figure 4.7). The time convergence seems more pronounced in the case of education than in housing (Annex Figures A4.2 and A4.3)

Figure 4.7: Overall HOI Circa 1995 and 2008



4.2. Heterogeneity in Sub-regional Human Opportunity Indices

In this section we discuss two issues: (i) the relationship between national and sub-national HOIs and (ii) whether or not more decentralized countries are more effective in equalizing sub-national HOIs.

1) Relationship between national and sub-national Human Opportunity Indices

Many economists interested in regional differences tend to examine variation in regional poverty outcomes, focusing mainly on income inequality (see Shankar and Shah, 2003, and Von Braun and Grote, 2002). While it is valid to analyze income inequality across regions of a given country, there is less consensus on what type of "just" redistributive policy would follow from the analysis. Income (or geographic GDP) equality depends on factors outside the control of policy makers, and not only on equality of opportunity but also on personal

responsibility and random shocks (luck).⁹ Much more consensus exists on creating redistributive justice by equalizing opportunities—leveling the playing field—especially for children.

No single statistical measure can capture the myriad dimensions of regional disparities. The last section showed that while disparities tend to be larger in regions with lower HOIs, these same regions tend to grow faster than those with higher HOIs. The standard deviation of overall, educational and housing HOIs is a useful summary statistic that reflects regional differences in access to key goods and services. The standard deviation is weighted by the population share of each location to avoid biasing the indicator toward small and very unequal regions, considering that some countries have more regions or sub-national governments than others.

When countries have near-universal coverage of access to basic services, such as Argentina, Uruguay or Chile, they also have relatively low dispersion in their sub-national HOIs. Countries with lower HOIs show a wider disparity across sub-national HOIs. The countries with the highest dispersion in the

sample between the two periods are Peru, Honduras and Nicaragua with dispersion values of 15 to 21, followed by Guatemala, Paraguay, El Salvador, Colombia and Dominican Republic with dispersion values between 10 and 15. Countries with the lowest dispersion are, as expected, Chile, Uruguay, Argentina and Costa Rica. One exception is Peru, with the highest dispersion circa 1995 and yet an HOI just below the mean.

SN HOIs show a degree of convergence, as countries expand and equalize human opportunities as they develop. Countries with low HOIs tend to have a larger spread of SN HOIs, while countries with a higher national HOI have a lower sub-national spread. The dispersion of SN HOIs tends to be higher, the lower the national-level index (Figure 4.8). In this sense, achieving more coverage with more equality over time tends to close regional disparities in opportunities. In most countries the dispersion in SN HOIs decreased between circa 1995 and 2008, except in Nicaragua, Honduras, Guatemala, and Ecuador, where it increased even though the overall HOI for those countries improved during the period (Figure 4.9).

⁹ Even if policy makers could control regional outcomes, the WDR 2009 asserts that it is not efficient to equalize geographical GDP. Instead, people in different regions can be empowered to move if desired to regions with more dynamic economic activity.

Figure 4.8: Dispersion of HOI Circa 1995 and 2008

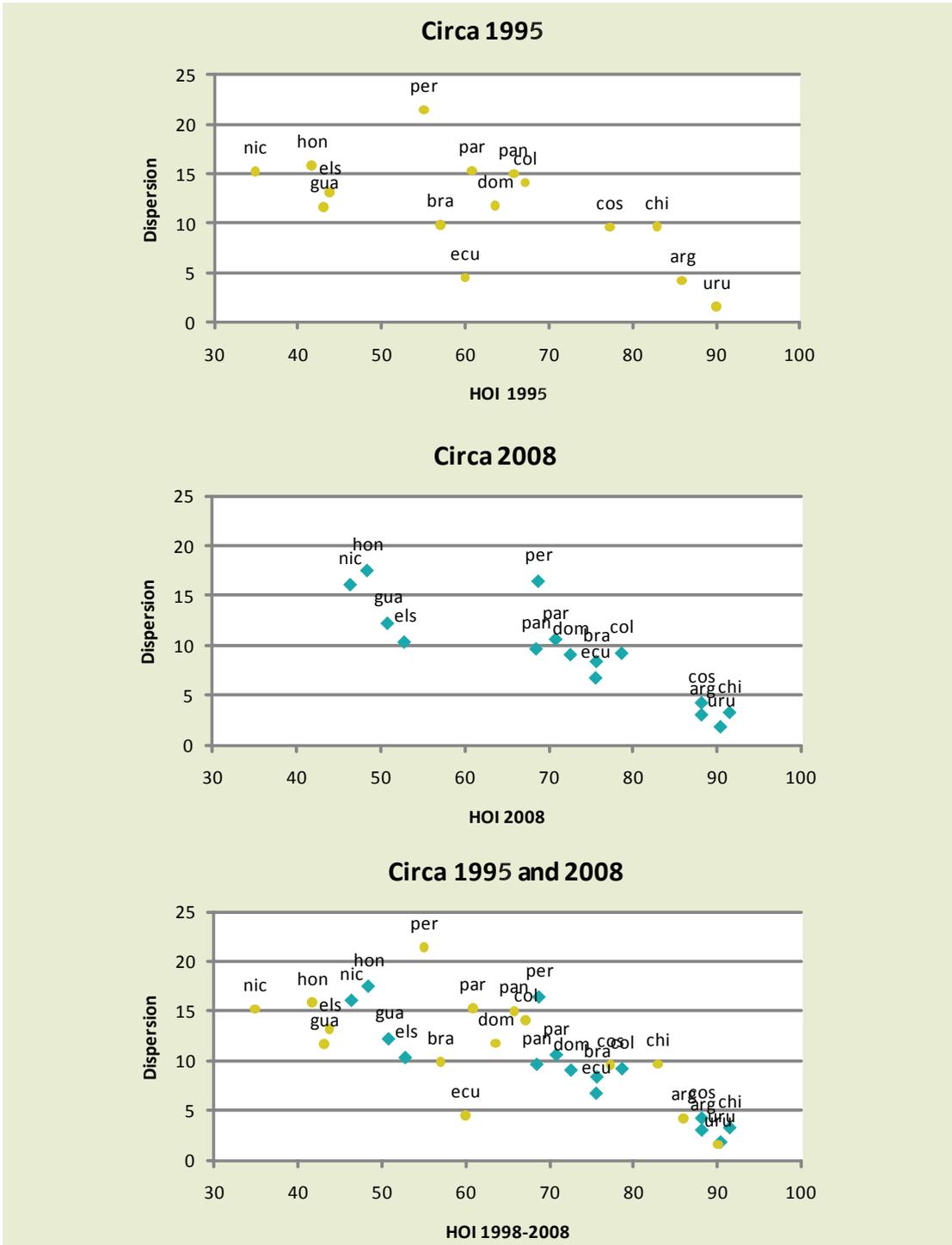
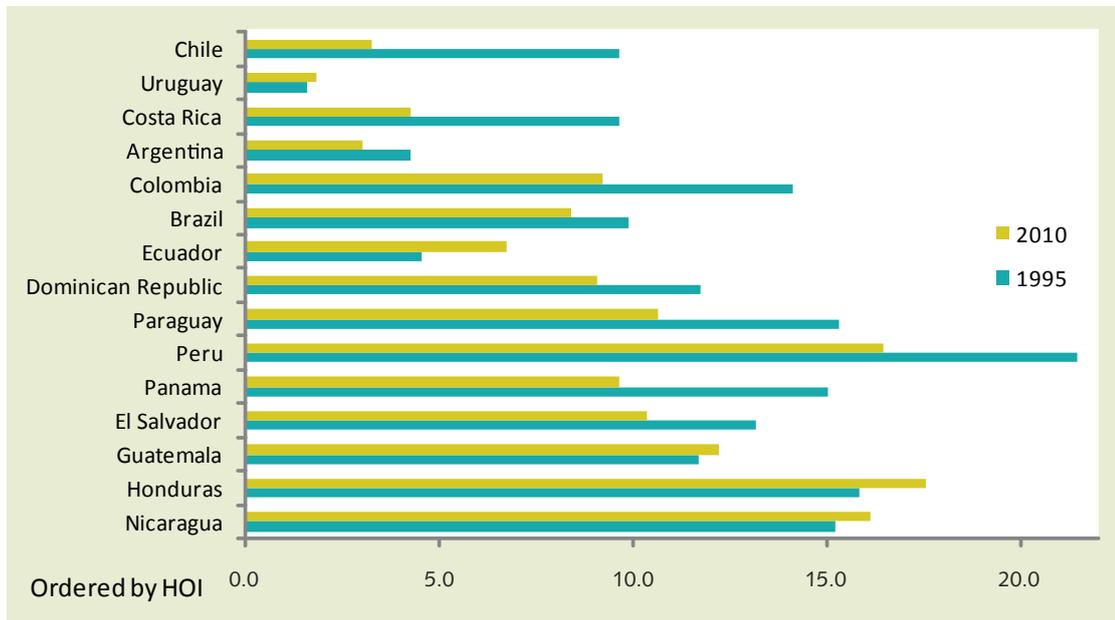


Figure 4.9. Regional Dispersion decreased in most countries

2) Do federal countries equalize HOIs more than unitary countries?

It is clear from the previous sub-section that Latin American countries have had some convergence in the dispersion of their SN HOIs, that regions with the lowest levels of access to services tend to improve faster than the more favorable regions, and that countries with the highest (lowest) national HOIs have the lowest (highest) spread in their SN HOIs.¹⁰ In this section, we inquire whether other factors help explain why

some countries have more disparities than others, controlling for the level of their national HOI. The analysis focuses in particular on decentralization as a possible explanatory factor. Because several countries which are not formally federal have decentralized expenditure as much or in some cases more than federal countries, the analysis considers both political and expenditure decentralization.

The literature on fiscal federalism has developed some interesting hypotheses on whether federal countries tend to

¹⁰ The literature on geographical GDP convergence (see Barro and Sala-I-Martin, 1991) distinguishes two types of convergence in growth: sigma convergence and beta convergence. A falling dispersion of real per capita income across a group of economies over time signifies sigma convergence, while a negative partial correlation between growth in income over time and its initial level signifies beta convergence. Hence, in the case of the HOI there is both sigma convergence—since there is a reduction in the dispersion of SN HOIs—and also beta convergence that produces faster growth in regions with lower coverage, corrected for inequality opportunities. Some authors also showed that beta convergence is necessary for sigma convergence.

have less or more regional disparities than more unitary systems. Proponents of decentralization maintain that the potential threat of disunion in federal states generates an incentive to reduce regional disparities, and hence federal countries are expected to have less disparity.¹¹ As well, local governments—being closer to the public—will have better information and thus will be able to ensure better provision of public services such as education and housing. Decentralization supporters also argue that centralized policy making often favors particular regions or cities and burdens all regions with uniform policies and public services too unresponsive to local needs and conditions, thus increasing spatial inequality.

On the other hand, flexibility in choosing policy instruments is curtailed by the division of powers in a federation. Central governments in unitary states are relatively unconstrained in their choice of appropriate policy instruments, and hence might be more efficient in diminishing inequalities. Further, the advantage of local information could be outweighed by economies of scale and positive externalities with large-scale service provision by a central government. Critics of decentralization

argue that a central government can more easily redistribute resources from more to less advantaged regions, and has an interest in providing public services and policies equally across the country.¹² Some authors (see Burki et al, 1999) also claim that decentralizing expenditure can shift power from national to local elites and might act as an incentive corruption at the local level and limit improvements in local services provision.

In the past few decades, Latin America has undergone a major decentralization process, involving institutional, fiscal and political reforms. The process has differed from country to country, not only in the intensity and depth of the reforms, but also in their outcomes (Table 4.1). There are only two formally federal countries in the sample of LAC countries considered: Argentina and Brazil. That said, the rest of the countries under study have elections at least at the municipal level, offering some elements of decentralized political systems.

With respect to fiscal federalism, the experience is more varied. Some countries have a high level of decentralization on the expenditure side, such as Argentina, Brazil and Colombia, while other countries such as Chile, Costa Rica and El Salvador are much

¹¹ Decentralization can also increase regional disparities between jurisdictions. Prud'homme (1994, 1996) argues that decentralized redistribution is likely to lead to different treatment of similar individuals in a country. For example, jurisdictions with higher per capita income would be able to provide higher levels of public services than those with lower per capita income. Residents in wealthier jurisdictions could even be levied at lower tax rates for higher levels of public services than those in poor jurisdictions.

¹² See Faguet and Shami, 2008, for an excellent exposition of advantages and disadvantages of decentralization in promoting regional equality.

more centralized. The process of fiscal decentralization on the revenue side is not as deep as on the expenditure side. Except for Argentina and Brazil, most LAC countries do not raise significant amounts of sub-national taxes. Also, data on sub-national revenues is much less accurate than sub-national expenditure

data. As a result, we use sub-national expenditure data to measure the extent of fiscal decentralization.¹³ Expenditure data, being continuous in nature, more accurately reflects the fact that decentralization is not an “all-or-nothing” phenomenon, and that countries exist along a continuum of reform.

Table 4.1

Federalism in Selected Countries of Latin America

Country	Formally	Dummy Formal	Subnational Government Spending/Total Government Spending	
			1995	2004
Argentina	Federal	1	49.3	49.3
Bolivia	Unitary	0	26.7	25.1
Brazil	Federal	1	45.6	47.0
Chile	Unitary	0	13.6	12.8
Colombia	Unitary	0	39	44.7
Costa Rica	Unitary	0	2.3	3.1
Dominican Republic	Unitary	0	3.2	3.2
Ecuador	Unitary	0	7.5	17.5
El Salvador	Unitary	0	6	5.1
Guatemala	Unitary	0	10.3	10.3
Honduras	Unitary	0	12.3	12.3
Nicaragua	Unitary	0	5.2	5.0
Panama	Unitary	0	2.9	1.0
Paraguay	Unitary	0	6.2	4.0
Peru	Unitary	0	10.5	19.0
Uruguay	Unitary	0	14.2	13.7
Venezuela, R.B de	Federal	1	19.6	19.6

¹³ We use the decentralization data gathered by the IDB through a series of interviews, and used by Stein (1999) and updated by Daughters and Harper (2007), so we can relate this index to measures of dispersion in 1995 and 2008 to test our hypothesis.

The analysis on the relationship between political and fiscal federalism and regional inequality of opportunity is preliminary, suggesting possible areas for further research. To test the hypothesis as to whether decentralization increases or decreases spatial dispersion in the HOI, we run linear regressions with the variability measure as the dependent variable, and as independent variables the log of the national overall HOI, the formal index of federalism or alternatively the log of expenditure measure of decentralization, and the log size of the country (in square km).

A caveat worth mentioning is that decentralization is complex and most countries have diverse institutions and arrangements, and the use of quantitative methods with a small number of control variables runs the risk of simplification. This explains the heavy reliance on case studies and qualitative methods in the decentralization literature. However, cross-national analysis can provide insights into how concepts and theory translate into practice, and it can indicate general trends that might otherwise be masked. While cross-national studies do not provide country-specific policy

prescriptions, they can improve our understanding of how phenomena such as decentralization work in general terms, and are useful when interpreted in this light.¹⁴

The econometric results suggest lower levels of regional dispersion are correlated with higher HOI levels, greater expenditure decentralization, and smaller land areas (Table 4.2). While the data is limited and further analysis warranted, the results also indicate that federal systems are associated with lower levels of regional dispersion. This is true using either a specification based on government expenditure or one based on a political definition, although the latter is significant only at the 10 percent level (columns 1 and 2, Table 4.2). As expected, the higher the HOI index, the lower the dispersion: the coefficient is negative and statistically significant at the 1 percent level. The log of area has a positive and statistically significant coefficient at the 5 percent level in both specifications of columns (1) and (2), meaning the larger the land size of the country, the more likely is that the dispersion in basic goods and services is also larger. Hence, it appears more

¹⁴ Another problem in a cross section without a long time series is that country-specific unobserved variables can bias and confound interpretation of coefficients. Control variables in part mitigate these effects.

¹⁵ The log of population was also used as a control variable alternative to the size of the country. Its coefficient was positive as expected, but not statistically significant. The coefficient on the political dummy for federalism is negative and statistically significant at the 5 percent level, meaning that federal countries have a lower dispersion in the level of overall opportunities corrected for inequalities. However, only two countries in the sample are federal (the sample for regions or sub-national areas in Venezuela, the other federal country, was not representative for estimating the HOIs and had to be dropped). Hence this dummy is only for Argentina and Brazil, and thus could be confounding the effect of just federalism (though size in the sample is already controlled by the log of surface area).

difficult for larger countries to equalize basic goods and services, for same level of development and decentralization. A country's land area is less significantly associated with the education HOI than with the housing HOI, suggesting that it is less difficult to bring educational opportunities to remote areas than housing opportunities. The size of the country is positively associated with inequality only in the case of housing, and appears less relevant in the distribution of educational opportunities across locations. Expenditure decentralization appears not to exert significant influence on the spread of housing opportunities across locations, but it does seem to exert a negative and significant effect on the education HOI, significant at the 5 percent level.¹⁶ Here too political federalism seems to be negatively correlated with the extent of regional inequality in accessing housing and education opportunities, although again these results are tentative and call for further research. Fiscal decentralization seems associated with lower regional dispersion of HOIs, and especially of educational HOIs. Most countries in Latin America have decentralized schooling systems for at least a significant share of education responsibilities (only Costa

Rica, Ecuador, Panama, Paraguay and Uruguay retain centralized educational systems). However, even in LAC countries that have decentralized primary education, the central government retains some functions at the national level (Burki et al, 1999).

In the case of housing infrastructure, responsibilities are shared among national, provincial, state and also with state or private enterprises, often creating accountability and responsibility problems in the provision of water, sanitation and electricity. As noted by Foster (2005), the decentralization of water and sanitation services to small local governments in LAC led to a loss of economies of scale in service delivery in countries such as Argentina, Colombia, and Peru, entailing a sudden fragmentation of the industry into hundreds of small municipal providers. In a number of cases, decentralization preceded subsequent water sector reform by a number of years. This lack of synchronicity between structural and regulatory reform was unfortunate because it meant that regulatory reform had to be superimposed on an industry structure that was often far from optimal in an economic sense. Hence, it might be that well-coordinated and managed

¹⁶ There is a small number of observations (N=30) to perform tests only asymptotically valid to analyze further the statistical properties of the OLS model. However, robust and clustered standard errors were estimated for the model, resulting in similar standard errors, albeit smaller in the case of the robust option. None of the conclusions significantly changed.

¹⁷ More research needs to be done to ascertain the reasons for the lack of significance of the coefficient on decentralization for housing. Some authors such as Foster (2005) and Zannetta (2004) find that the problem is "inadequate" decentralization without controls from the central government and a clear assignment of specific functions between local and central governments, more than decentralization per se, that explains the policy failure.

expenditure decentralization even in the case of housing might help equalize housing opportunities.¹⁷

This analysis suggests that fiscal decentralization may have been more effective in diminishing regional inequalities in the case of education

than in the case of sanitation, water or electricity. At a minimum it is clear that equalizing housing and education opportunities will require different policies in each sector, although there are some common policy principles, as discussed in next section.

Table 4.2

Table 4.2 OLS Estimates Subnational Dispersion in HOIs

OLS Estimates Subnational Dispersion in HOIs
(Using Weighted Standard Deviation)

	All Oportunities		Housing Opportunities		Education Opportunities	
	(1)	(2)	(3)	(4)	(5)	(6)
Federal	-6.5044** (-2.61)		-7.6218** (-2.09)		-3.7787* (-1.84)	
Subspend		-1.9492* (-1.85)		-1.7374 (-1.13)		-1.7979** (-2.25)
InArea	1.3765** (2.54)	1.4244** (2.07)	1.9282** (2.47)	1.7281* (1.74)	0.4801 (1.08)	0.8306 (1.62)
InHOIj	-14.5857*** (-5.93)	-15.0744*** (-5.77)	-13.1582*** (-5.53)	-13.7144*** (-5.47)	-10.3580*** (-3.94)	-10.5387*** (-4.11)
Constant	64.2908*** (6.51)	69.6409*** (6.77)	58.1717*** (6.08)	64.4961*** (6.79)	48.7070*** (4.51)	51.1109*** (4.83)
N	30	30	30	30	30	30
r ²	0.6235	0.5799	0.5908	0.5445	0.4165	0.4481
F	14,3544	11,9619	12,5105	10,3595	6,1859	7,0376

t statistics in parentheses

* p<0.10 ** p<0.05 *** p<0.01

Note: Columns 1 and 2, which show the estimates for the overall HOI constructed from the average of the five basic housing and education opportunities, only differ in the control used to proxy federalism is based on a political definition or empirical government expenditure

We conclude that significant regional inequalities persist in many LAC countries. By most measures of regional inequality, countries with lower access to basic goods and services tend to have more regional dispersion, but also tend to experience higher rates of improvement in the index, demonstrating a growing regional convergence in the provision of basic goods and services. Some evidence indicates that more fiscally decentralized countries achieve less HOI disparity, at least in terms of education.¹⁸ But large dispersions still need to be addressed to level the playing field for children born in different locations.

4.3. Equalizing Regional Opportunities

The WDR 2009 “Reshaping Economic Geography” calls for countries not equalize basic opportunities across provinces/states, rather than trying to equalize outcomes such as GDP or poverty rates. Hence, the objective is not only reaching universal coverage of basic opportunities, but also to ensure that until universal coverage is achieved, the distribution of access to basic services should be equalized across regions. Some policy measures can assist countries to achieve greater fiscal equity and redistribute government expenditure

to more unequal regions. The problem is to find the best and most efficient approach in LAC, given concerns over public sector accountability and in light of the predominance of hybrid political structures (neither clearly federal nor unitary) where functions tend to be superimposed and not always clearly defined.

Since decentralization seems irreversible in LAC countries, a possible way to help accelerate the reduction in regional disparities could be to design an equal opportunity policy coordinated by the central government and implemented at the sub-national level. Local governments in all LAC countries rely at least partially on transfers from central governments, so this policy could take the form of an “equal opportunity grant” transfer from central to local governments to mitigate inequality in accessing opportunities. This would involve distributing, on a per capita basis, resources to provinces that attain specific goals in access to education, health and sanitation. The HOI is an ideal index to measure performance under conditional grants aimed at leveling the playing field in accessing opportunities, because it is straightforward to estimate given widely available household data in LAC and has clear interpretations.

In the 1980s and 1990s, many countries

¹⁸ Regressions were also run using macro-regions for the countries that in Annex Table A4.1 were subdivided by provinces, and the same regions for the rest. Although the size of the dispersion changes in several cases, the results of the regression remain basically unaltered, even increasing the significance of the coefficients of some variables, such sub-national expenditure.

in Latin America introduced fiscal grants to sub-national governments to support decentralization. Some of these programs were conditional on inputs (classroom construction, teacher salaries). However, input conditionality undermines budgetary autonomy and flexibility without providing any assurance of achieving results.¹⁹ Hence, the proposal is that the grant should be conditioned on attaining equitably distributed access to basic services. That is, the grant would be more concerned with outputs rather than with inputs. A growing number of countries are implementing transfer programs conditioned on attaining particular opportunities across states or regions: the Australian National Schools Specific Purpose Payments; the Canadian Health Transfers (CHT) program; the Brazilian Unified Health System (SUS) and the FUNDEF program for primary schooling; and Chile's grants to municipal governments for water and sewer access for the poor (see Shah, 2010).

Some have suggested that the move in recent years to output-based budgeting in place of input-based budgeting should be mirrored by a shift towards performance-based grants, particularly for capital grants (Steffensen and Larsen, 2005). In contrast, Smart and Bird (2009) claim performance-based grants

cannot work for most intergovernmental systems. They maintain that there may be a limited role for a "reward" system of grants, in which those who perform best get the most. Given that most local governments depend on secure (pre-committed) grant funding to carry out many activities, and where many grant programs are intended to meet "needs" rather than to reward those who have already succeeded in doing so, performance-based budgeting may be challenging to implement.

Hence, while output and performance-based grants are clearly superior incentives for local governments to help provide opportunities for accessing key goods and services, "penalties" can be hard to sustain in the face of pre-committed funds designed to provide access basic services. Some authors propose a form of conditional grant, without curtailing pre-committed funds but with public exposure of performance. In Australia, the National School Program is part of an overall reporting and accountability framework, and states must provide performance data to the Commonwealth and to the general public. A continuous and independent dissemination of the estimation of the HOI across sub-regions could be fundamental in improving performance and accountability without hurting citizens.

¹⁹ Hanushek (2003) reviews available evidence on the effects of schooling inputs and outcomes, and did not find any evidence that spending more on teachers or schools improves student outcomes.

In contrast, the United States enacted a highly conditional national education program in 2001 through the No Child Left Behind Act. This act transfers funds from the federal government and requires states to establish goals for all students and for groups of students characterized by race, ethnicity, poverty, disability, and limited English proficiency, and requires schools to make annual progress in meeting these goals. If goals are not met as determined by test standards, the school and the state are subject to sanctions.²⁰ If the performance of local governments and schools does not improve, transfers can be made directly to the individual, making sure her opportunities are enhanced.

While No Child Left Behind has been controversial, Hanushek and Raymond (2005) find that despite flaws the act has a positive impact on achievement. However, the impact holds just for states attaching consequences to performance.²¹ This is an important finding to take into account for countries designing an equal opportunity grant. The authors also found that although the grant increased average performance, the performance of blacks increased more

slowly than whites, hence widening the black-white education achievement gap. If the HOI for educational achievement were estimated based on the standardized achievement test (as in Chapter 3), and if grants are conditional on these indices, some of the problems associated with inequality in the increased achievement scores could be avoided.

Along these lines, the WDR 2009 stressed the need for “collecting and disseminating credible information on service entitlements to increase the accountability of service providers and improve outcomes” at the sub-national level. Collecting HOIs periodically can serve this purpose, and they are an optimal index to target and condition federal grants, at minimum by publicizing performance. Until now, the only data available has been on poverty rates, income per capita, and other outcome measures. While useful, these cannot help policies that focus on improving equitable access to basic services, such that children in poorer regions have equal access to opportunities that are critical to allow them to develop their potential.

Based on the stylized facts about

²⁰ A school failing to make adequate progress for three consecutive years must initiate a performance improvement plan and also give students the option to move to other public schools. A fourth year of failure requires restructuring and supplemental education services. If a school fails to make progress in the fifth year, it must implement restructuring, including changes in staff and management or converting into a semi-private (charter) school. The district must provide transportation to the new school. The state must permit low-income students attending persistently failing schools to use special funds to obtain supplemental educational services from the public or private providers selected by the students and their parents.

²¹ In the authors' words, “States that simply provide better information through report cards without attaching consequences to performance do not get significantly larger impacts over no accountability.”

the evolution of HOIs for different opportunities and across regions, the available literature on grant design and expenditure decentralization, and the institutional and political context in most LAC countries, several principles should be considered for equal opportunity grants:

- The grant can be distributed to different levels of government depending on the specific institutional structure of the country—unitary, federal or the myriad of intermediate options. Functions and responsibilities of each level of government in equalizing opportunities should be assigned clearly. In the case of housing, and also to some extent in education, responsibilities are often shared among national, provincial, state as well as private enterprises. This mixed approach to service delivery can create problems of accountability and quality, possibly explaining the lack of better results in equalizing basic service opportunities across regions.
- The expenditure “need” for each opportunity to access a key good or service should be calculated. The cost is likely to vary inversely with the specific coverage rate and directly with inequality of opportunity: in more remote locations the cost per capita is expected to be higher and it is also expected that other circumstances such as family education or family income would

be lower for those locations, and hence the need to equalize with even higher expenditure per capita.

- For ease of monitoring and implementation, the grants should be divided by key good or service. Canada enacted in 1996 a joint conditional grant (CHST) for health, education and social minimum standards of coverage and insurance by province, but later subdivided it to better monitor compliance and better calculate amounts for each key good or service.
- The grant is not meant to replace an equalization transfer. As noted by Vaillancourt and Bird (2004), the central aim of an equalization transfer is to enable sub-national governments with different abilities to raise revenues to provide comparable levels of services. Since no country is completely uniform, a fundamental characteristic of a decentralized state is that sub-national governments have different fiscal capacities and are unable to provide the same level of public services at the same tax rates. Equalization transfers are mostly unconditional and thus permit regional differences. The equal opportunity grant can complement equalization transfers by conditioning the grant on actually attaining national target goals for service equitable service provision. In fact, the central government in Canada has

two main transfers, the unconditional equalization transfer and the CHST, a major conditional transfer to guarantee horizontal equity. Australia has also a conditional grant called Special Purpose Payments (SPP) and a formal equalization program that is mostly unconditional. About half of transfers are through the SPP to achieve national policy objectives, mainly for education and health care.

- This type of grant would be better as a performance-based grant rather than one conditioned on inputs. The grant should be conditional on gradually attaining equality of opportunity across locations and within each location. It should reward good performers and penalize bad performers, without punishing inhabitants. The government should be liable, not the individual. To achieve this, each country should evaluate the advantages and disadvantages of conditionality ranging from a minimum of publicizing results up to enacting penalties of varying degrees.

- Whatever conditionality is employed, the systematic collection, analysis, and reporting of information is important to verify compliance with stated goals and to assist future decisions (Bird, 2000). Unless central agencies monitor and evaluate local performance, there can be no

assurance that nationally important goods and services are adequately provided once they have been decentralized. An important part of any decentralization program is thus improved national evaluation capacity.

- Above all, a widely publicized commitment to leveling the playing field across all regions of the country is essential. All individuals should be aware of this and should periodically receive data on the progress of different local governments in achieving the agreed goals. When public commitment or enthusiasm wanes and conditionality becomes lax, then the grant ends up becoming an unconditional grant without any result or improvement (see Zanetta, 2004 for an example).

4.4. Summary and Conclusions

This chapter estimates a series of sub-national Human Opportunity Indices (SN HOIs) using data from 30 household surveys for 15 Latin American and Caribbean (LAC) countries over a period of more than a decade (1995-2009). Together, the surveys represent more than 160 sub-regions. Using the same opportunities for accessing key services, circumstances and overall methodology as in Chapter 2 for building the national indices, the chapter seeks to uncover some basic stylized facts on regional

inequality of opportunities and outlines a possible instrument to redress this inequality. The main findings are:

- The range for SN HOIs is much higher than the range of national HOIs: from 96 for Tierra del Fuego, Argentina to 29 in the Atlantic Region, Nicaragua and 31 in Morazán, El Salvador. Capital cities tended to have higher HOIs than the rest of their respective countries. Moreover, the higher the HOI, the narrower the gap between access to opportunities in capital cities and the rest of the country.
- Overall, disparities in accessing basic services within most LAC countries reflect differences in housing SN HOIs more than differences in education SN HOIs. Housing SN HOIs have a higher range than education SN HOIs, and the differences between capital cities and the rest of the country are much more pronounced for housing than for education. All capital cities ranked better than the rest of the country for housing, but this was not always the case for education.
- Access to basic services appears to be converging over time within regions of a country. The highest increases in the HOIs were attained mostly by sub-regions with the lowest initial HOI, and the lowest growth was attained by the capitals (mostly of high HOI countries, such

as Argentina, Chile, Colombia and Costa Rica). A strong negative and statistically significant relationship was found between the rate of growth of the 165 SN HOIs and the initial level of the SN HOI. This convergence was stronger in the case of the education HOI, suggesting that it is more challenging to level the playing field in housing compared to education.

- Sub-regional differences in accessing key services tend to decrease as the overall level of the HOI increases. In most countries the dispersion in the sub-national HOIs decreased between circa 1995 and 2008. Moreover, measuring inequality in SN HOIs among sub-regions through the weighted standard deviation, countries with the highest HOI tended to have the lowest dispersion. Since the average education HOI is higher than the average housing HOI, there was less dispersion in the education HOI than in the housing HOI.
 - Higher HOIs, expenditure decentralization, and small country size are associated with less sub-regional HOI dispersion. While the data was not conclusive, it suggests that political decentralization may also be correlated with more regional equality.
- To help level the playing field, the chapter offers some guiding principles



to design a performance-based “equal opportunity” grant. This grant would promote government accountability and would help ensure that children in each province

receive equal opportunities to access basic services, thereby accelerating convergence towards universal coverage.





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ANNEXES

Chapter 1

Annex 1: A Numerical Example of Computing the HOI

To help explain the computation of the HOI, we use the example presented in Tables A1.1a-1i (below), in which the overall population is divided in 16 circumstance groups, defined by gender, race and location. We assume that all groups are the same size: 100 persons, leading to a total population of 1600. Table A1.1a presents the number of people in each circumstance group that have access to a specific basic service (for example, clean water, electricity or vaccinations). Overall, 400 people have access to the service. Since the total population is 1600, the overall coverage rate is 25 percent. Under equality of opportunity, 25 percent of each circumstance group should be covered. Coverage rates, however, vary substantially, from 0 percent in some groups to 75 percent in others (Table A1.1b).

The computation of the penalty is done in three steps. First, we identify all circumstance groups with coverage rate below the average rate (25 percent, in our example); we refer to them as the opportunity-vulnerable groups. There are 10 of these groups in our example, marked in red in Table A1.1b. Second, we compute the gap between the number of people in each vulnerable group that should have access to the service for it to reach the average coverage rate, and the actual number of people with access to

the service in that group (Table A1.1c). Third, the penalty is obtained by dividing the sum of the opportunity gaps of all vulnerable groups (called the overall opportunity gap) by the total population. In our example the penalty would be equal to 10 percent, since the sum of all opportunity gaps equals 160 (Table A1.1c) and the overall population is 1600. The overall coverage rate of 25 percent minus the penalty due unequal allocation of 10 percent leads to an HOI of 15 percent ($C - P = O$; $25 - 10 = 15$). In this example, only 90 individuals from opportunity-vulnerable groups are covered, out of 250 that should have been covered had equality of opportunity prevailed. Hence, 160 people among these vulnerable groups should receive the service for their coverage rate to rise at least to the average. This total opportunity gap, 160, equals 10 percent of the total population.

Since services are available for 400 people, and 160 people in non-vulnerable groups receive services in excess of what is needed for equality of opportunity to prevail, only 240 people received services that were allocated equitably. Hence, as a proportion of the total population, the number of people who receive the service according to the principle of equality of opportunities is 15 percent ($240/1600$). This is what the HOI measures.

Table A1.1

Table A1.1a: Distribution of a service					Table A1.1d: Distribution of the population					Table A1.1g: Improperly allocated services				
	North		South			North		South			North		South	
	Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural
Whites	75	60	45	20	Whites	100	100	100	100	Whites	50	35	20	0
Men Blacks	50	50	30	20	Men Blacks	100	100	100	100	Men Blacks	25	25	5	0
Whites	15	10	5	0	Whites	100	100	100	100	Whites	0	0	0	0
Women Blacks	15	5	0	0	Women Blacks	100	100	100	100	Women Blacks	0	0	0	0

Table A1.1b: Group-Specific Coverage Rates					Table A1.1e: Opportunity gaps as a proportion of the total population					Table A1.1h: Improperly allocated services as a proportion of the total population				
	North		South			North		South			North		South	
	Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural
Whites	75%	60%	45%	20%	Whites	0%	0%	0%	0%	Whites	3%	2%	1%	0%
Men Blacks	50%	50%	30%	20%	Men Blacks	0%	0%	0%	0%	Men Blacks	2%	2%	0%	0%
Whites	15%	10%	5%	0%	Whites	1%	1%	1%	2%	Whites	0%	0%	0%	0%
Women Blacks	15%	5%	0%	0%	Women Blacks	1%	1%	2%	2%	Women Blacks	0%	0%	0%	0%

Table A1.1c: Opportunity Gaps (for vulnerable groups)					Table A1.1f: Opportunity gaps as a proportion of the population covered					Table A1.1i: Improperly allocated services as a proportion of the population covered				
	North		South			North		South			North		South	
	Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural		Urban	Rural	Urban	Rural
Whites	0	0	0	5	Whites	0%	0%	0%	1%	Whites	13%	9%	5%	0%
Men Blacks	0	0	0	5	Men Blacks	0%	0%	0%	1%	Men Blacks	6%	6%	1%	0%
Whites	10	15	20	25	Whites	3%	4%	5%	6%	Whites	0%	0%	0%	0%
Women Blacks	10	20	25	25	Women Blacks	3%	5%	6%	6%	Women Blacks	0%	0%	0%	0%

Annex 2: A Numerical Illustration of the Decomposition of the HOI

The HOI can be easily computed from the distribution of the population by circumstance groups (Table A2.1a) and specific coverage rates (Table A2.1b) through four simple steps (Table A2.1c). First, we compute the overall coverage rate as the weighted average of all group-specific coverage rates (35 percent in population A). Second, we identify groups with specific coverage rates below average (marked in red). Third, we obtain the penalty (12.5 percent in population A) by weighting the difference between the overall coverage and each group-specific coverage rate among vulnerable groups: $(35 - 15) * 0.25 + (35 - 5) * 0.25 = 12.5$. Finally, we obtain the HOI (22.5 percent in population A) by subtracting the penalty from the overall coverage.

Using the same procedure and the information for population B in the last row of Table A2.4c, we obtain an HOI of 37 percent for population B. One can think of population A and B as being the same country in two different time periods. Population B has an HOI 14.5 percentage points higher than population A. This difference is due to disparities in both the distribution of the populations among circumstance groups and the pattern of their specific coverage rates. In population B, the north region has a 20 percentage-point higher population share. In terms of coverage rates, those among the vulnerable groups tend to be higher in population B, whereas those among the non-vulnerable groups are higher in population A. Coverage rates are on average higher and less unequal in population B than in population A.

Table A1.2

Table A2.1a: Distribution of the population A

100%	North	South
Men	25%	25%
Women	25%	25%

Table A2.1b: Group-specific coverage rate for population A

35%	North	South
Men	75%	45%
Women	15%	5%

Table A2.1c: Computing the HOI for population A

Overall coverage rate	35.0%
Penalty	12.5%
HOI	22.5%

Table A2.2a: Distribution of the population B

100%	North	South
Men	40%	10%
Women	30%	20%

Table A2.2b: Group-specific coverage rate for population A

40%	North	South
Men	75%	45%
Women	15%	5%

Table A2.2c: Computing the HOI for population B with the coverage rates from population A

Overall coverage rate	40.0%
Penalty	14.5%
HOI	25.5%

Table A2.3a: Distribution of the population B

100%	North	South
Men	40%	10%
Women	30%	20%

Table A2.3b: Group-specific coverage rate (structure from population A, average level from population B)

45%	North	South
Men	84%	51%
Women	17%	6%

Table A2.3c: Computing the HOI for population B with the structure of coverage rates from population A and average level from population B

Overall coverage rate	45.0%
Penalty	16.3%
HOI	28.7%

Table A2.4a: Distribution of the population B

100%	North	South
Men	40%	10%
Women	30%	20%

Table A2.4b: Group-specific coverage rate for population B

45%	North	South
Men	65%	40%
Women	40%	15%

Table A2.4c: Computing the HOI for population B

Overall coverage rate	45.0%
Penalty	8.0%
HOI	37.0%

To isolate the effect on the HOI of differences in the distribution of population among circumstance groups, we estimate the HOI for a combined situation: coverage rates are still those of population A, but the distribution of the population among circumstance groups is now that of population B. The estimated HOI for this hybrid situation is 25.5 percent.

Since this hybrid population shares with population A the same group-specific coverage rate, their difference in HOI (3.0 p.p.) is entirely due to their differences in the distribution of the population among circumstance groups. This is the composition effect. On the other hand, since the hybrid population shares with population B the same distribution of the population among circumstance groups, their difference in HOI (11.5 p.p.) is entirely due to their differences in their specific coverage rates. Hence, this difference is the coverage effect. Hence, the total difference in HOI (14.5 p.p.) between populations A and B is decomposed into the composition effect of 3 p.p. and 11.5 p.p. due to the coverage effect.

The coverage effect can be decomposed further (see Tables A2.3a-c). The group-specific coverage rates in Table A2.3b are constructed to reach the average level in population B, holding the inequality level of population A. This is accomplished by proportionally increasing all group-specific rates from population A. Inequality would be

preserved while the average coverage rate is adjusted. To reach the average coverage rate of population B, all group-specific coverage rates from population A are multiplied by the ratio between the overall coverage for population B and A ($45/40=1.125$).¹

As a consequence, the HOIs in Tables A2.3c and A2.4c share the same distribution of the population among circumstance groups and the same overall coverage rate (45 percent). They only differ with respect to the inequality of their group-specific coverage rates. Since the overall coverage rate is the same in both cases, the difference in inequality is captured by corresponding differences in the size of the penalty: 16.3 percent in Table A2.3c and 8 percent in Table A2.4c. The difference between these two penalties, 8.3 p.p., is a measure of the equalization effect. It is the contribution of the greater equality of opportunities in population B to the difference in HOI between the two populations.

On the other hand, Tables A2.2c and A2.3c share the same distribution of the population and the same inequality among group-specific coverage rates as measured by the ratio between the penalty and the overall coverage rate. This ratio is equal to 0.3625 in the two cases. Hence, the difference between HOIs in these tables (3.2 p.p.) is entirely due to their corresponding differences in overall coverage rates. It represents the scale effect.

¹ Notice that the relevant average for population A is not the original average but that using the population weights from population B (see Table A2.2c).

Annex 3: The Algebra of Decomposing the Human Opportunity Index

Consider two populations A and B. Let w_k^A denote the population share of circumstance-group k and C_k^A its specific coverage rate in population A, with w_k^B and C_k^B denoting the corresponding characteristics in population B. In this case, HOI^A can be expressed as

$$HOI^A = C^A - \sum_{k \in V^A} w_k^A (C^A - C_k^A)$$

where

$$C^A = \sum_k w_k^A C_k^A$$

and

$$V^A = \{k : C_k^A < C^A\}$$

with similar expressions holding for HOI^B .

To obtain the decomposition we begin with a hybrid HOI^{A^B} combining the group-specific coverage rates of population A with the composition of population B.

$$HOI^{A^B} = C^{A^B} - \sum_{k \in V^{A^B}} w_k^B (C^{A^B} - C_k^A)$$

where

$$C^{A^B} = \sum_k w_k^B C_k^A$$

and

$$V^{A^B} = \{k : C_k^A < C^{A^B}\}$$

Since HOI^A and HOI^{A^B} share the same group-specific coverage rates, $\Delta_c = HOI^{A^B} - HOI^A$ measures the composition effect, i.e., the impact of differences in the distributions of the populations A and B among circumstance groups. On the other hand, since HOI^B and HOI^{A^B} have the same population shares, $\Delta_r = HOI^B - HOI^{A^B}$ measures the coverage effect, i.e., the impact of the differences in group-specific coverage rates between populations A and B. Notice that the total difference is the sum of the coverage and composition effect: $\Delta = HOI^B - HOI^A = \Delta_r + \Delta_c$.

To further decompose the coverage effect in an equalization effect and a scale effect, we construct the following hybrid group-specific coverage rate,

$$C_k^{A^B} = C_k^A \frac{C^B}{C^{A^B}}$$

Based on these hybrid group-specific coverage rates and noticing that

$$C^* = \sum_k w_k^B C_k^{A^B} = C^B$$

we estimate a new index via

$$HOI^* = C^B - \sum_{k \in V^*} w_k^B (C^B - C_k^{A^B})$$

where

$$V^* = \{k: C_k^{A^B} < C^B\}$$

Since HOI^* and HOI^{A^B} have the same population shares and level of inequality among group-specific coverage rates, $\Delta_s = HOI^* - HOI^{A^B}$ measures the scale effect, i.e., the impact of the differences in the level of the coverage rates between populations A and B. On the other hand, since HOI^B and HOI^* have the same population shares and overall coverage rate, $\Delta_e = HOI^B - HOI^*$ measures the equalization effect, i.e., the impact of the differences in the degree of inequality among group-specific coverage rates between populations A and B. Notice that the coverage effect is the sum of the scale and equalization effects: $\Delta_\gamma = HOI^B - HOI^{A^B} = \Delta_s + \Delta_e$.

Annex 4: Definitions of Indicators

Adequate access to water	Children 0 to 10 year: old	This variable takes the value of one if the household has access to running water within the dwelling. Thus access includes public network connections and all water pumped into the dwelling even if it is not from the public network.
Access to electricity	Children 0 to 10 year: old	This variable takes the value of one if the dwelling has access to electricity from any source. Thus sources can range from the electrical grid system to solar panels.
Adequate access to sanitation	Children 0 to 10 year: old	This variable takes the value of one if the dwelling has access to a flush toilet (either inside the dwelling or inside the property) that is connected to any mechanism whereby household waste is allowed to flow away from the dwelling.
School attendance rate	Children 10 to 14 years old	This is the measured as children aged 10-14 attending to school, independent of grade. This variable measures the gross attendance rate.
Probability of completing sixth grade on time	Children 12 to 16 years old	This is measured by computing the probability of having ended sixth grade on time for all children ages 12 to 16. In most countries of the region, this means having completed primary education. Given that on average children start school at the age of 7, by age 13, students that have survived in the system without repetition should have completed six years of basic education.

Source: The World Bank and Universidad Nacional de La Plata (CEDLAS) Socioeconomic Database for Latin America and the Caribbean.

Annex 5: Choosing the Aggregation Sequence

To create an overall HOI, one needs to aggregate both the different dimensions of each person's opportunities (that is, the indicators used to proxy a basic opportunity) and also aggregate the opportunities of different persons to obtain a societal aggregate. Ideally, one first should aggregate the opportunities of each person first, to fully consider the interdependence among the dimensions.

This interdependence among the dimensions has two features worth noting. First, the dimensions could be complements or substitutes. For instance, should attendance and progression in school be considered complements or substitutes? Second, the access to different goods and services could be concomitant or alternative. For instance, an overall 50 percent coverage rate for water and electricity could still lead to very distinct distributions. In one extreme, it may be the case that those having access to water are the same people having access to electricity. In this case, the accesses to these two services are perfectly correlated. On the other extreme, it may be that either one has access to water or to electricity, never to both. In this case, access to these two services is inversely related. If the two services are substitutes, an inverse relation is preferable. If they are complements, a positive association is preferable.

Hence, to properly evaluate opportunities

one needs to know the degree of complementarity or substitutability between goods and services as well as the distribution of a population's access opportunities. Ultimately, aggregation takes into consideration the complementarities and substitutability among the many dimensions.

It may be useful to consider the extreme case in which the access opportunity is either 0 percent or 100 percent. Suppose I_1 indicates whether everyone has ($I_1=1$) or not ($I_1=0$) proper access to sanitation and I_2 indicates whether everyone has ($I_2=1$) or not ($I_2=0$) adequate access to electricity. Three alternative aggregation strategies are possible in this example. The most demanding alternative would consider that one has an opportunity when he/she has access to both sanitation and electricity. In this case, the aggregated opportunity index would be: $I=I_1 \times I_2$ and $I=1$ if and only if $I_1=1$ and $I_2=1$. This is the intersection approach. In the other extreme, the least demanding alternative would consider the two opportunities as substitutes. In this case having one of them is enough. Access to a second would not lead to any significant improvement. In this case, the aggregated opportunity index would be: $I=1-(1-I_1) \times (1-I_2)$ and $I=1$ if and only if $I_1=1$ or $I_2=1$. This is the union approach. An intermediate alternative is to relax the requirement that both are essential and, instead of going to the extreme that just one is enough, one may consider each one as an independent advantage. In this case, the aggregated opportunity index would be: $I=I_1+I_2$. This is the counting approach.

To properly take the distribution of access opportunity and degree of complementarity/substitutability into consideration, the many dimensions of opportunities faced by each person must be aggregated before aggregating among people. Once the aggregation across persons of each dimension is conducted, how positively or negatively correlated are the accesses to the many relevant key goods and services is lost.

A comprehensive consideration of the inter-relation among dimensions also demands that information on the many dimensions be available for each person. To properly consider inter-dependence, for each person in the analysis one needs simultaneous information on his/her access to all key goods and services being considered. Since many opportunities are age-specific, like attending school at age 10 and completing 6th grade at age 13, a longitudinal survey or a survey with considerable amount of retrospective information would be required.

Given the lack of such information among Latin American countries and for simplicity, we opted for reversing the order of aggregation. We first aggregate

each dimension (like the opportunity of access to water) across people, and later aggregate dimensions. Certainly, we could aggregate first a proxy of the five indicators consider in this study, and we plan to do this exercise in the very near future. However, one of the main advantages of the HOI is its flexibility to track progress in a variety of basic goods and services. In country specific works we can combine information from different sources such as health surveys, living standard measurements surveys, student assessment test scores, among others. For keeping this flexibility, we would like to have as our base procedure a simple methodology that will allow us to combine information from different sources in building an overall HOI.

If the indicators are continuous, a variety of other alternative aggregation procedures would be available. These alternatives would include weighted versions of the three approaches introduced above as well as completely different function forms. For instance, an expression mimicking a constant elasticity of substitution function could be used.



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ANNEXES

Chapter 2

Table A2.1: Surveys Used to calculate the HOI

Description of the surveys used to calculate the HOI				
Country	Circa 1995	Circa 2010	Coverage	Survey
Argentina	1998	2008	Urban	Encuesta Permanente de Hogares
Bolivia		2007	National	Encuesta Continua de Hogares
Brazil	1995	2008	National	Pesquisa Nacional por Amostra de Domicilios
Chile	1996	2006	National	Encuesta de Caracterización Socioeconómica Nacional
Colombia	1997	2008	National	Encuesta de Calidad de Vida
Costa Rica	1994	2009	National	Encuesta de Hogares de Propósitos Múltiples
Dominican Republic	2000	2008	National	Encuesta Nacional de Fuerza de Trabajo
Ecuador	1995	2006	National	Encuesta de Condiciones de Vida
El Salvador	1998	2007	National	Encuesta de Hogares de Propósitos Múltiples
Guatemala	2000	2006	National	Encuesta Nacional sobre Condiciones de Vida
Honduras	1999	2006	National	Encuesta Permanente de Hogares de Propósitos Múltiples
Jamaica	1996	2002	National	Jamaica Survey of Living Conditions
Mexico	1996	2008	National	Encuesta Nacional de Ingresos y Gastos de los Hogares
Nicaragua	1998	2005	National	Encuesta Nacional de Hogares sobre Medición de Nivel de Vida
Panama	1997	2003	National	Encuesta de Niveles de Vida
Paraguay	1999	2008	National	Encuesta Permanente de Hogares
Peru	1998	2008	National	Encuesta Nacional de Hogares
Uruguay	2006	2008	National	Encuesta Nacional de Hogares Ampliada
Venezuela, R.B de	1995	2005	National	Encuesta de Hogares por Muestreo

Source: The World Bank and Universidad de La Plata (CEDLAS) Socioeconomic Database for Latin America and the Caribbean.

Table A2.2:
Overall Human Opportunity Index and Decomposition in Latin American and Caribbean Countries (1995 and 2010)

Overall Human Opportunity Index and Decomposition in Latin American and Caribbean Countries (1995 and 2010)

Country	Opportunity index (%)			Decomposition (p.p.)			Decomposition (%)			Extrapolation (%)					
	Circa 1995	If the population of 2010 lived in 1995	Considering the inequality of 2010 and the average	Circa 2010	Annual rate of change (p.p.)	Composition Effect	Coverage Effect			Composition Effect	Coverage Effect				
							Total	Equalization Effect	Scale Effect		Total	Equalization Effect	Scale Effect		
Argentina	86.1	90.6	89.4	88.3	0.2	0.45	-0.23	-0.12	-0.11	204	-104	-55	-49	85.4	88.8
Brazil	57.0	70.7	72.8	75.7	1.4	1.05	0.39	0.16	0.23	73	27	11	16	57.0	78.6
Chile	83.0	89.0	90.1	91.6	0.9	0.60	0.26	0.11	0.16	70	30	12	18	82.2	95.1
Colombia	67.1	73.3	75.4	78.7	1.1	0.56	0.50	0.20	0.30	53	47	19	28	65.0	80.9
Costa Rica	77.3	83.2	84.5	88.2	0.7	0.39	0.34	0.09	0.25	54	46	12	34	78.0	88.9
Dominican Republic	63.8	73.6	73.6	72.7	1.1	1.23	-0.12	0.00	-0.12	110	-10	0	-11	58.2	74.9
Ecuador	59.8	46.1	50.0	75.7	1.4	-1.25	2.70	0.36	2.34	-86	186	25	161	59.8	81.5
El Salvador	43.9	38.3	41.3	52.8	1.0	-0.62	1.61	0.33	1.28	-62	162	33	129	40.9	55.8
Guatemala	42.9	48.0	49.2	51.1	1.4	0.85	0.51	0.19	0.32	62	38	14	24	36.1	56.5
Honduras	41.7	44.8	45.1	47.6	0.8	0.44	0.39	0.04	0.36	53	47	4	43	38.4	50.9
Jamaica	79.5	79.7	79.7	81.2	0.3	0.04	0.25	0.00	0.25	15	85	-1	86	79.2	83.5
Mexico	65.4	81.9	83.2	86.3	1.7	1.37	0.37	0.11	0.25	79	21	7	15	63.6	89.7
Nicaragua	35.0	38.6	39.8	46.3	1.6	0.52	1.10	0.17	0.92	32	68	11	57	30.1	54.3
Panama	65.7	69.5	69.6	68.6	0.5	0.63	-0.15	0.02	-0.17	130	-30	4	-34	64.7	72.0
Paraguay	60.7	69.5	68.6	71.0	1.1	0.97	0.17	-0.10	0.27	85	15	-9	24	56.1	73.3
Peru	54.8	60.5	63.4	68.7	1.4	0.57	0.82	0.28	0.54	41	59	20	39	50.7	71.5
Uruguay	89.0	91.3	91.0	90.5	0.7	1.12	-0.41	-0.15	-0.26	157	-57	-21	-36	81.2	91.9
Venezuela, R.B de	82.1	91.3	90.2	86.6	0.5	0.92	-0.47	-0.11	-0.35	204	-104	-25	-79	82.1	88.9
LAC Average	64.2	68.9	69.8	73.4	1.0	0.5	0.4	0.1	0.3	55	45	10	35	61.7	76.5

Source: Author's calculations based on household surveys

Table A2.3:
Human Opportunity Index in Education and Decomposition Latin American and Caribbean Countries: National, 1995 and 2010

Opportunity index in Education and Decomposition Latin American and Caribbean countries: National, 1995 and 2010

Countries	Opportunity index (%)					Decomposition (p.p.)				Decomposition (%)				Extrapolation (%)	
	Circa 1995	If the population of 2010 lived in 1995	Considering the inequality of 2010 and the average	Circa 2010	Annual rate of change (p.p.)	Composition Effect	Coverage Effect			Composition Effect	Coverage Effect			1995	2010
							Total	Equalization Effect	Scale Effect		Total	Equalization Effect	Scale Effect		
Argentina	90.6	93.8	93.2	89.7	-0.1	0.32	-0.41	-0.06	-0.35	-328	428	66	362	90.9	89.5
Brazil	50.9	60.3	62.6	66.1	1.2	0.72	0.45	0.18	0.27	61	39	15	23	50.9	68.4
Chile	85.6	89.0	89.5	90.2	0.5	0.34	0.12	0.05	0.07	73	27	11	16	85.1	92.1
Colombia	67.9	71.9	75.1	81.3	1.2	0.36	0.85	0.30	0.56	30	70	24	46	65.5	83.7
Costa Rica	70.8	77.5	78.3	81.0	0.7	0.45	0.23	0.05	0.18	66	34	8	26	71.5	81.6
Dominican Republic	67.7	74.1	74.7	74.9	0.9	0.80	0.11	0.08	0.03	88	12	9	3	63.1	76.7
Ecuador	71.8	71.7	74.3	82.7	1.0	-0.01	1.00	0.23	0.76	-1	101	24	77	71.8	86.6
El Salvador	54.6	51.5	54.3	65.9	1.3	-0.34	1.60	0.31	1.29	-27	127	25	103	50.8	69.7
Guatemala	45.2	49.2	50.5	52.4	1.2	0.68	0.54	0.21	0.33	56	44	17	27	39.1	57.3
Honduras	52.9	55.7	57.4	63.5	1.5	0.40	1.11	0.23	0.88	27	73	15	58	46.9	69.6
Jamaica	92.1	92.6	92.9	94.0	0.3	0.09	0.22	0.04	0.18	29	71	12	59	91.8	96.5
Mexico	76.0	86.7	87.7	89.6	1.1	0.88	0.24	0.08	0.16	79	21	7	14	74.9	91.8
Nicaragua	49.5	52.5	53.9	59.0	1.4	0.43	0.93	0.19	0.74	31	69	14	55	45.5	65.8
Panama	78.3	81.3	81.3	80.7	0.4	0.49	-0.09	0.00	-0.09	123	-23	1	-24	77.6	83.5
Paraguay	68.1	74.0	74.3	74.1	0.6	0.59	0.01	0.03	-0.02	98	2	5	-3	66.3	75.3
Peru	71.9	76.1	78.3	84.6	1.3	0.42	0.85	0.22	0.63	33	67	17	49	68.1	87.1
Uruguay	85.6	87.1	87.0	86.6	0.5	0.72	-0.24	-0.06	-0.18	150	-50	-13	-37	80.3	87.6
Venezuela, R.B de	77.1	85.5	85.4	84.0	0.7	0.84	-0.15	-0.01	-0.13	121	-21	-2	-20	77.1	87.5
LAC Average	69.8	73.9	75.0	77.8	0.9	0.5	0.4	0.1	0.3	53	47	13	34	67.6	80.6

Source: Author's calculations based on household surveys

Table A2.4:
Human Opportunity Index in Housing Conditions and Decomposition in Latin American and Caribbean Countries: National, 1995 and 2010

Opportunity index in Housing Conditions and Decomposition in Latin American and Caribbean countries: National, 1995 and 2010

Countries	Opportunity index (%)				Decomposition (p.p.)					Decomposition (%)			Extrapolation (%)		
	Circa 1995	If the population of 2010 lived in 1995	Considering the inequality of 2010 and the average probability of 1995	Circa 2010	Annual rate of change (p.p.)	Composition Effect	Coverage Effect			Composition Effect	Coverage Effect			1995	2010
							Total	Equalization Effect	Scale Effect		Total	Equalization Effect	Scale Effect		
Argentina	81.5	87.4	85.7	86.9	0.5	0.59	-0.05	-0.18	0.13	109	-9	-33	24	79.9	88.0
Brazil	63.2	81.1	83.0	85.3	1.7	1.38	0.32	0.14	0.18	81	19	8	10	63.2	88.7
Chile	80.5	89.1	90.7	93.1	1.3	0.86	0.40	0.16	0.24	68	32	13	19	79.2	98.1
Colombia	66.3	74.6	75.7	76.2	0.9	0.76	0.14	0.10	0.04	84	16	11	5	64.5	78.0
Costa Rica	83.8	88.9	90.7	95.5	0.8	0.34	0.44	0.12	0.32	43	57	16	41	84.6	96.3
Dominican Republic	59.9	73.1	72.5	70.4	1.3	1.66	-0.34	-0.07	-0.26	126	-26	-6	-20	53.3	73.1
Ecuador	47.7	20.4	25.7	68.8	1.9	-2.48	4.40	0.48	3.91	-130	230	25	205	47.7	76.4
El Salvador	33.1	25.1	28.2	39.7	0.7	-0.90	1.62	0.35	1.27	-124	224	49	175	31.0	41.8
Guatemala	40.7	46.8	47.8	49.7	1.5	1.02	0.49	0.17	0.32	68	32	11	21	33.2	55.8
Honduras	30.5	33.9	32.8	31.6	0.2	0.48	-0.33	-0.16	-0.17	320	-220	-105	-114	29.9	32.2
Jamaica	66.8	66.8	66.5	68.4	0.3	0.00	0.27	-0.05	0.32	-1	101	-17	118	66.5	70.5
Mexico	54.7	77.1	78.8	83.0	2.4	1.86	0.49	0.15	0.35	79	21	6	15	52.4	87.7
Nicaragua	20.4	24.7	25.8	33.5	1.9	0.61	1.26	0.16	1.10	33	67	8	59	14.8	42.9
Panama	53.0	57.6	57.9	56.4	0.6	0.78	-0.20	0.04	-0.24	135	-35	6	-41	51.8	60.5
Paraguay	53.3	64.9	66.8	67.4	1.4	1.16	0.25	0.19	0.06	83	17	13	4	49.1	70.2
Peru	37.8	45.0	48.4	52.9	1.5	0.72	0.79	0.34	0.44	48	52	23	29	33.3	55.9
Uruguay	92.4	95.5	95.0	94.3	0.9	1.52	-0.57	-0.23	-0.34	161	-61	-25	-36	82.0	96.2
Venezuela, R.B de	87.1	97.1	95.0	89.2	0.2	1.00	-0.79	-0.22	-0.58	475	-375	-103	-272	87.1	90.3
LAC Average	58.5	63.8	64.8	69.0	1.1	0.6	0.5	0.1	0.4	92.0	8.0	-5.4	13.4	55.7	72.4

Source: Author's calculations based on household surveys

Table A2.5: D-Index for Completing Sixth Grade on Time, by Circumstance, Circa 2008 (percent)

D-Index for Completing Sixth Grade on Time, by Circumstance, circa 2008 (percent)									
Country	Parent's education	Gender	Gender of Household		Per Capita Income	Urban or Rural	Presence of Parents	Number of Siblings	Overall D-Index
			Head						
Argentina	1.1	0.8	0.2		0.5		0.2	0.7	3.9
Bolivia	3.0	0.5	1.8		0.8	0.5	2.2	1.6	6.4
Brazil	9.0	7.6	0.3		7.2	1.6	2.2	2.6	19.1
Chile	0.7	0.3	0.4		0.3	0.0	0.1	0.6	3.0
Colombia	4.8	3.2	0.5		1.0	2.9	1.8	1.9	9.9
Costa Rica	3.5	1.7	1.0		0.5	0.6	1.3	2.6	7.7
Dominican Republic	7.7	5.2	0.6		3.6	0.6	0.3	2.6	13.5
Ecuador	3.0	0.3	0.2		1.4	0.1	0.1	1.3	5.9
El Salvador	8.3	3.0	2.1		3.6	3.7	0.3	3.9	15.9
Guatemala	18.7	2.6	7.7		4.9	8.6	5.7	6.5	26.6
Honduras	8.2	3.2	1.0		3.0	3.1	1.1	2.8	15.5
Jamaica	0.0	0.2	0.0		0.2	0.0	0.3	0.5	0.8
Mexico	1.6	0.8	0.5		0.3	0.3	0.5	0.8	3.4
Nicaragua	13.1	7.3	1.8		6.3	10.6	0.1	7.7	24.2
Panama	3.5	2.4	0.5		2.1	1.0	0.3	2.8	8.7
Paraguay	5.4	3.4	0.2		2.6	0.7	1.5	3.3	10.4
Peru	3.3	0.5	0.4		1.6	0.7	0.4	1.4	7.3
Uruguay	1.8	1.1	0.1		0.8	0.2	0.5	1.4	5.6
Venezuela, R.B de	2.9	1.9	0.0		0.6	0.3	0.3	2.0	6.1
LAC Average	5.2	2.4	1.0		2.2	2.0	1.0	2.5	10.2

Source: Author's calculations based on household surveys

Table A2.6: D-Index for School Enrollment Ages 10-14, by Circumstance, Circa 2008 (percent)

D-Index for Completing Sixth Grade on Time, by Circumstance, circa 2008 (percent)									
Country	Parent's education	Gender	Gender of Household		Per Capita Income	Urban or Rural	Presence of Parents	Number of Siblings	Overall D-Index
			Head						
Argentina	1.1	0.8	0.2		0.5		0.2	0.7	3.9
Bolivia	3.0	0.5	1.8		0.8	0.5	2.2	1.6	6.4
Brazil	9.0	7.6	0.3		7.2	1.6	2.2	2.6	19.1
Chile	0.7	0.3	0.4		0.3	0.0	0.1	0.6	3.0
Colombia	4.8	3.2	0.5		1.0	2.9	1.8	1.9	9.9
Costa Rica	3.5	1.7	1.0		0.5	0.6	1.3	2.6	7.7
Dominican Republic	7.7	5.2	0.6		3.6	0.6	0.3	2.6	13.5
Ecuador	3.0	0.3	0.2		1.4	0.1	0.1	1.3	5.9
El Salvador	8.3	3.0	2.1		3.6	3.7	0.3	3.9	15.9
Guatemala	18.7	2.6	7.7		4.9	8.6	5.7	6.5	26.6
Honduras	8.2	3.2	1.0		3.0	3.1	1.1	2.8	15.5
Jamaica	0.0	0.2	0.0		0.2	0.0	0.3	0.5	0.8
Mexico	1.6	0.8	0.5		0.3	0.3	0.5	0.8	3.4
Nicaragua	13.1	7.3	1.8		6.3	10.6	0.1	7.7	24.2
Panama	3.5	2.4	0.5		2.1	1.0	0.3	2.8	8.7
Paraguay	5.4	3.4	0.2		2.6	0.7	1.5	3.3	10.4
Peru	3.3	0.5	0.4		1.6	0.7	0.4	1.4	7.3
Uruguay	1.8	1.1	0.1		0.8	0.2	0.5	1.4	5.6
Venezuela, R.B de	2.9	1.9	0.0		0.6	0.3	0.3	2.0	6.1
LAC Average	5.2	2.4	1.0		2.2	2.0	1.0	2.5	10.2

Source: Author's calculations based on household surveys

Table A2.7: D-Index for Access to Adequate Sanitation, by Circumstance, Circa 2008 (percent)

D-Index for Access to Adequate Sanitation, by Circumstance, circa 2008 (percent)

Country	Parent's education	Gender	Gender of Household		Per Capita Income	Urban or Rural	Presence of Parents	Number of Siblings	Overall D-Index
			Head	Per Capita Income					
Argentina	6.6	0.8	0.5	6.6		1.0	1.1	11.7	
Bolivia	15.3	0.6	4.0	13.0	29.0	1.5	3.9	33.0	
Brazil	2.0	0.0	0.4	2.5	4.5	0.0	0.3	8.7	
Chile	1.8	0.2	0.1	2.6	4.0	0.4	0.3	5.2	
Colombia	6.4	0.2	1.0	3.7	12.7	1.6	2.2	15.6	
Costa Rica	0.9	0.0	0.2	1.1	0.6	0.2	0.2	2.6	
Dominican Republic	10.7	0.2	2.1	10.0	16.2	2.9	2.0	20.5	
Ecuador	7.2	0.4	0.4	11.4	12.9	1.4	3.3	21.1	
El Salvador	18.5	0.0	3.3	27.7	33.3	4.7	4.0	40.5	
Guatemala	17.7	0.1	10.6	19.6	35.2	4.5	4.6	40.8	
Honduras	14.1	0.7	1.3	17.7	23.6	2.1	0.6	34.7	
Jamaica	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.3	
Mexico	2.7	0.0	0.7	2.7	7.5	0.1	1.1	13.1	
Nicaragua	8.1	0.3	1.6	8.3	14.0	2.0	0.1	21.2	
Panama	14.6	0.1	1.1	20.6	20.8	5.7	3.5	31.5	
Paraguay	8.6	0.2	0.8	13.3	16.5	1.5	2.0	23.9	
Peru	4.4	0.2	0.2	4.7	11.9	0.7	0.4	16.9	
Uruguay	0.3	0.0	0.1	0.7	0.1	0.0	0.0	1.2	
Venezuela, R.B de	3.0	0.0	0.5	1.5	1.4	1.1	0.6	5.3	
LAC Average	7.5	0.2	1.5	8.8	13.6	1.7	1.6	18.3	

Source: Author's calculations based on household surveys

Table A2.8: D-Index for Access to Adequate Water, by Circumstance, Circa 2008 (percent)

D-Index for Access to Adequate Water, by Circumstance, circa 2008 (percent)

Country	Parent's education	Gender	Gender of Household		Per Capita Income	Urban or Rural	Presence of Parents	Number of Siblings	Overall D-Index
			Head	Per Capita Income					
Argentina	0.3	0.0	0.0	0.3		0.0	0.1	0.8	
Bolivia	2.0	0.6	0.7	2.0	12.0	1.0	1.4	14.6	
Brazil	1.3	0.1	0.3	1.7	3.2	0.1	0.2	7.0	
Chile	0.4	0.1	0.1	0.4	2.1	0.1	0.1	2.6	
Colombia	3.4	0.5	0.4	1.8	8.3	1.3	2.1	11.2	
Costa Rica	0.5	0.1	0.4	0.6	0.5	0.3	0.1	1.3	
Dominican Republic	4.2	0.3	0.7	3.5	6.7	0.9	0.3	9.4	
Ecuador	2.9	0.3	0.4	5.7	4.6	0.8	0.1	10.2	
El Salvador	17.5	1.0	3.1	29.8	34.5	5.8	4.0	41.5	
Guatemala	1.7	0.3	1.1	2.8	8.5	0.3	0.1	10.2	
Honduras	15.7	0.8	0.9	17.5	16.4	1.5	1.0	33.1	
Jamaica	6.2	0.6	8.9	2.5	30.8	5.3	7.2	31.1	
Mexico	1.4	0.3	0.1	1.4	3.8	0.6	0.8	6.1	
Nicaragua	13.7	3.1	4.3	21.4	36.8	8.7	3.4	42.7	
Panama	1.3	0.1	0.9	2.7	2.6	0.3	0.8	6.4	
Paraguay	3.7	0.0	0.1	4.7	5.6	0.9	0.8	10.3	
Peru	3.7	0.1	0.5	8.6	15.3	1.0	0.6	21.3	
Uruguay	0.9	0.0	0.2	2.1	0.8	0.0	0.1	4.1	
Venezuela, R.B de	1.6	0.0	0.1	0.7	2.0	0.6	0.0	3.5	
LAC Average	4.3	0.4	1.2	5.8	10.8	1.5	1.2	14.1	

Source: Author's calculations based on household surveys

Table A2.9: D-Index for Access to Electricity, by Circumstance, Circa 2008 (percent)

D-Index for Access to Electricity, by Circumstance, circa 2008 (percent)

Country	Parent's education	Gender	Gender of Household		Per Capita Income	Urban or Rural	Presence of Parents	Number of Siblings	Overall D-Index
			Head						
Argentina									
Bolivia	3.2	0.1	0.3		2.0	10.1	0.7	0.3	17.0
Brazil	0.1	0.0	0.0		0.1	0.5	0.0	0.0	1.6
Chile	0.1	0.0	0.0		0.1	0.2	0.0	0.0	0.3
Colombia	0.7	0.1	0.4		0.3	1.7	0.6	0.0	2.5
Costa Rica	0.1	0.0	0.0		0.1	0.1	0.0	0.0	0.4
Dominican Republic	0.3	0.0	0.1		0.1	0.8	0.0	0.0	2.0
Ecuador	0.2	0.1	0.0		0.7	1.8	0.1	0.3	3.6
El Salvador	1.7	0.0	0.2		1.9	2.7	0.2	0.4	6.4
Guatemala	4.4	0.1	1.1		4.9	5.1	0.7	0.3	10.8
Honduras	3.7	0.1	0.4		7.4	12.2	0.3	0.3	21.7
Jamaica	0.7	0.1	1.6		0.4	1.9	0.8	0.5	2.8
Mexico	0.1	0.0	0.0		0.1	0.3	0.0	0.1	0.7
Nicaragua	6.6	0.7	3.2		6.3	16.7	0.0	0.4	22.5
Panama	3.3	0.3	1.0		10.7	10.0	0.2	3.7	19.4
Paraguay	0.4	0.1	0.1		0.6	0.8	0.1	0.0	2.1
Peru	3.5	0.0	0.2		2.2	10.8	0.2	0.8	16.2
Uruguay	0.1	0.0	0.0		0.1	0.3	0.0	0.0	0.7
Venezuela, R.B de	0.1	0.0	0.0		0.1	0.3	0.0	0.0	0.6
LAC Average	1.6	0.1	0.5		2.1	4.2	0.2	0.4	7.3

Source: Author's calculations based on household surveys

ANNEXES

Chapter 3

Table A3.1: Circumstance Variables Used in PISA Analysis

Circumstance Variables Used in PISA Analysis	
Variable	Definition
Child gender	Dummy variable taking on a value of 1 for male
School location	Dummy variables taking on a value of 1 for each one of the following categories: <ul style="list-style-type: none"> § A village, hamlet or rural area (fewer than 3,000 people) § A small town (3,000 to about 15,000 people) § A town (15,000 to about 100,000 people) § A city (100,000 to about 1,000,000 people) <p>The dummy for for a large city (with over 1,000,000 people) was excluded to avoid collinearity.</p>
Father's education	Dummy variables taking on a value of 1 for each one of next categories: <ul style="list-style-type: none"> § Completed ISCED 3A (Upper Secondary, general) § Completed ISCED 3B, 3C (Upper Secondary, vocational) § Completed ISCED 2 (Lower Secondary) § Completed ISCED 1 (Primary) § Did not complete ISCED 1 (Did not complete primary) <p>The dummy for tertiary education was excluded to avoid collinearity.</p>
Mother's education	Dummy variables taking on a value of 1 for each one of next categories: <ul style="list-style-type: none"> § Completed ISCED 3A (Upper Secondary, general) § Completed ISCED 3B, 3C (Upper Secondary, vocational) § Completed ISCED 2 (Lower Secondary) § Completed ISCED 1 (Primary) § Did not complete ISCED 1 (Did not complete primary) <p>The dummy for tertiary education was excluded to avoid collinearity.</p>
Wealth index	Dummy variables taking on a value of 1 for each one of the deciles of wealth index created using 14 items common to all countries. Wealth index is score of first four principal components. The dummy for decile 1 was excluded to avoid collinearity. (We are currently re-estimating to use only the scores of the first principal component).
Father's occupation	Dummy variables taking on a value of 1 for each one of the eight categories of ISCO occupation classification on four digit basis. The dummy for Primary Occupations was excluded to avoid collinearity.

Table A3.2: Profile of Inequality of Proficiency at Level 2 in Reading

Profile of inequality of Proficiency at level 2 in reading: Relative Importance of the Six Circumstances by Country

Country	Most Important	2	3	4	5	6
Argentina	Socio-Economic Status	Gender	Father occupation	School location	Mother education	Father education
Brazil	Socio-Economic Status	Gender	Father occupation	Father education	Mother education	School location
Canada	Socio-Economic Status	Gender	Father occupation	Father education	Mother education	
Chile	Socio-Economic Status	Gender	School location	Mother education	Father occupation	Father education
Colombia	Socio-Economic Status	School location	Father occupation	Mother education	Father education	Gender
England	Father occupation	Socio-Economic Status	Gender	Father education	School location	Mother education
France	Socio-Economic Status	Father occupation	Gender	Mother education	Father education	
Germany	Socio-Economic Status	Gender	Father occupation	Mother education	Father education	School location
Italy	Gender	Socio-Economic Status	School location	Father occupation	Father education	Mother education
Mexico	School location	Gender	Socio-Economic Status	Mother education	Father occupation	Father education
Norway	Gender	Socio-Economic Status	Father occupation	Mother education	Father education	School location
Portugal	Socio-Economic Status	Father occupation	Gender	Mother education	Father education	School location
Spain	Socio-Economic Status	Father occupation	Gender	Mother education	Father education	School location
Sweden	Gender	Socio-Economic Status	Father occupation	Father education	Mother education	School location
Uruguay	Gender	Socio-Economic Status	Mother education	Father occupation	School location	Father education
USA						

Source: Author's calculations based on PISA data

Table A3.3: IPUMS Samples Analyzed

IPUMS Samples analyzed							
Country	Year	Census %	Households	Persons	Sanitation (Public)	Sanitation (Public + Septic)	Overcrowding
Europe							
1 Austria	2001	10	341,035	803,471	N	N	Y
2 Armenia	2001	10	81,929	326,560	N	N	Y
3 Belarus	1999	10	385,508	990,706	N	N	Y
4 France	1999	5	1,219,323	2,934,758	N	N	Y
5 Greece	2001	10	367,438	1,028,884	Y	N	Y
6 Hungary	2001	5	227,252	510,502	Y	Y	Y
7 Italy	2001	5	1,168,044	2,990,739	N	N	Y
8 Portugal	2001	5	258,843	517,026	Y	Y	Y
9 Romania	2002	10	732,016	2,137,967	Y	Y	Y
10 Slovenia	2002	10	63,637	179,632	N	N	Y
11 Spain	2001	5	714,473	2,039,274	N	Y	Y
North America							
12 United States	2000	5	6,184,438	14,081,466	N	N	Y
East and Central Asia							
13 Kyrgyz Republic	1999	10	110,285	476,886	Y	Y	Y
14 Mongolia	2000	10	55,795	243,725	N	N	Y
15 Vietnam	1999	3	534,139	2,368,167	N	N	N
Middle East and Africa							
16 Ghana	2000	10	397,097	1,894,133	N	N	Y
17 Jordan	2004	10	97,343	510,646	N	N	Y
18 Kenya	1999	5	317,106	1,407,547	Y	Y	Y
19 Rwanda	2002	10	191,719	843,392	Y	Y	Y
20 South Africa	2001	10	991,543	3,725,655	Y	Y	Y
21 Uganda	2002	10	529,271	2,497,449	N	N	N

Note: Additional countries will be included for Asia. Canada could not be analyzed because persons are not organized into households

Table A3.4A: HOI Access to Sanitation in LAC (Public System)

Human Opportunity Index: Access to Sanitation (Public System) (Children 0-16)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Argentina	2009	54	13	7	47	54	12	7	47
Bolivia	2007	32	36	11	20	31	36	11	20
Brazil	2008	44	20	9	35	44	19	8	36
Chile	2006	82	11	9	74	82	11	9	74
Costa Rica	2009	22	35	8	14	22	35	8	14
Dominican Republic	2008	19	29	5	13	18	29	5	13
Ecuador	2006	41	32	13	28	41	31	13	28
El Salvador	2007	32	43	14	18	32	42	13	19
Guatemala	2006	29	47	14	15	29	46	13	16
Honduras	2007	24	52	13	12	24	52	12	12
Jamaica	2002	12	46	6	7	15	44	6	8
Mexico	2008	49	25	12	37	49	24	12	37
Nicaragua	2005	15	50	8	7	15	50	8	8
Panama	2003	25	42	10	14	25	42	10	14
Paraguay	2008	5	45	2	3	5	44	2	3
Peru	2008	46	36	17	29	46	36	17	29
Uruguay	2008	46	19	9	37	46	16	7	38
Venezuela	2005	86	6	5	81	85	5	5	81

Source: Author's calculations based on SEDLAC data

Table A3.4B: HOI Access to Sanitation in Selected Countries (Public System)

Human Opportunity Index: Access to Sanitation (Public System) (Children 0-16)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Kenya	1999	5	67	3	2	5	65	3	2
Vietnam	1999	17	56	9	7	13	58	8	5
Kyrgyz Republic	1999	17	57	10	7	17	51	9	8
South Africa	2001	36	47	17	19	36	47	17	19
Romania	2002	39	50	19	20	39	48	19	21
Hungary	2001	50	14	7	42	50	12	6	44
Portugal	2001	59	23	13	45	59	22	13	45
Greece	2001	64	11	7	57	64	9	6	58
France	1982					70	3	2	69
USA	1990	73	6	5	68	73	4	3	70
Spain	2001	93	1	1	91	93	1	1	92

Source: Author's calculations based on IPUMS data

Table A3.5A: HOI Access to Sanitation in LAC (Public System + Septic Tank)

Human Opportunity Index: Access to Sanitation (Public System + Septic Tank) (Children 0-16)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Argentina	2009	82	5	4	77	81	5	4	77
Bolivia	2007	44	32	14	30	43	32	14	29
Brazil	2008	56	21	12	44	56	20	11	45
Chile	2006	91	5	5	86	91	5	5	86
Costa Rica	2009	95	2	2	93	95	2	2	93
Dominican Republic	2008	61	20	12	49	61	19	12	49
Ecuador	2006	64	20	13	51	63	19	12	51
El Salvador	2007	44	34	15	29	44	32	14	30
Guatemala	2006	35	40	14	21	35	39	14	21
Honduras	2007	36	37	13	22	35	36	13	23
Jamaica	2002	45	21	10	36	48	21	10	38
Mexico	2008	55	23	12	42	54	21	12	43
Nicaragua	2005	21	48	10	11	21	47	10	11
Panama	2003	46	31	14	31	45	30	13	32
Paraguay	2008	31	29	9	22	30	27	8	22
Peru	2008	63	17	10	53	63	17	10	52
Uruguay	2008	83	9	7	76	82	7	6	77
Venezuela	2005	88	5	4	84	88	5	4	84

Source: Author's calculations based on SEDLAC data

Table A3.5B: HOI Access to Sanitation in Selected Countries (Public System + Septic Tank)

Access to sanitation (public + septic tank)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Kenya	1999	6	66	4	2	6	64	4	2
Vietnam	1999	17	56	9	7	13	58	8	5
Kyrgyz Republic	1999	17	57	10	7	17	51	9	8
South Africa	2001	38	45	17	21	38	44	17	21
Romania	2002	48	42	20	28	48	36	17	31
Greece	2001	64	11	7	57	64	9	6	58
Hungary	2001	77	8	6	71	77	6	5	73
Portugal	2001	97	1	1	96	97	1	1	95
USA	1990	99	0	0	99	99	0	0	99

Source: Author's calculations based on IPUMS data

Table A3.6A: HOI Freedom from Severe Overcrowding in LAC

Human Opportunity Index: Freedom from Severe Overcrowding (Children 0-16) (>1.5 People Per Room)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Argentina	2009	45	29	13	32	44	28	12	32
Bolivia	2007	20	34	7	14	19	31	6	13
Brazil	2008	92	5	4	88	92	5	4	87
Chile	2006	88	5	4	84	88	5	4	84
Costa Rica	2009	85	8	7	78	85	8	7	78
Dominican Republic	2008	55	23	13	43	54	23	13	42
Ecuador	2006	67	16	11	57	67	15	10	56
El Salvador	2007	28	40	11	17	28	38	11	17
Guatemala	2006	15	51	7	7	14	49	7	7
Honduras	2007	54	23	13	42	54	23	12	42
Jamaica	2002	27	34	9	18	27	33	9	18
Mexico	2008	63	19	12	51	62	18	11	51
Nicaragua	2005	16	49	8	8	15	47	7	8
Panama	2003	38	36	14	24	37	35	13	24
Paraguay	2008	37	34	12	24	35	32	11	24
Peru	2008	41	24	10	31	40	23	9	30
Uruguay	2008	64	21	13	51	63	20	12	50
Venezuela	2005	46	27	12	33	45	27	12	33

Source: Author's calculations based on SEDLAC data

Table A3.6B: HOI Freedom from Severe Overcrowding in Selected Countries

Human Opportunity Index: Freedom from Severe Overcrowding (>1.5 People Per Room)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Mongolia	2000					10	41	4	6
Rwanda	2002	26	34	9	17	26	33	9	17
Ghana	2000	21	23	5	16	21	21	4	17
Jordan	2004	28	36	10	18	28	35	10	18
Kenya	1999	30	26	8	22	30	22	7	23
Armenia	2001	33	17	6	27	33	17	6	27
Kyrgyz Republic	1999	35	22	8	28	35	21	7	28
Romania	2002	45	23	10	35	45	23	10	35
South Africa	2001	52	20	10	41	52	17	9	43
Belarus	1999	50	15	8	42	50	13	7	44
Hungary	2001	56	19	11	45	56	18	10	46
Slovenia	2002					65	10	6	58
Greece	2001	75	11	8	67	74	10	7	66
Italy	2001	78	9	7	71	78	9	7	72
Portugal	2001	86	7	6	80	86	7	6	80
USA	2000	91	4	4	87	91	4	4	88
France	1999					93	3	3	90
Austria	2001	94	3	3	91	94	2	2	91
Spain	2001	94	3	3	91	94	3	2	92

Source: Author's calculations based on IPUMS data

Table A3.6A: HOI Freedom from Severe Overcrowding in LAC

Human Opportunity Index: Freedom from Severe Overcrowding (Children 0-16) (>1.5 People Per Room)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Argentina	2009	45	29	13	32	44	28	12	32
Bolivia	2007	20	34	7	14	19	31	6	13
Brazil	2008	92	5	4	88	92	5	4	87
Chile	2006	88	5	4	84	88	5	4	84
Costa Rica	2009	85	8	7	78	85	8	7	78
Dominican Republic	2008	55	23	13	43	54	23	13	42
Ecuador	2006	67	16	11	57	67	15	10	56
El Salvador	2007	28	40	11	17	28	38	11	17
Guatemala	2006	15	51	7	7	14	49	7	7
Honduras	2007	54	23	13	42	54	23	12	42
Jamaica	2002	27	34	9	18	27	33	9	18
Mexico	2008	63	19	12	51	62	18	11	51
Nicaragua	2005	16	49	8	8	15	47	7	8
Panama	2003	38	36	14	24	37	35	13	24
Paraguay	2008	37	34	12	24	35	32	11	24
Peru	2008	41	24	10	31	40	23	9	30
Uruguay	2008	64	21	13	51	63	20	12	50
Venezuela	2005	46	27	12	33	45	27	12	33

Source: Author's calculations based on SEDLAC data

Table A3.7A: HOI Freedom from Overcrowding in LAC

Human Opportunity Index: Freedom from Overcrowding (Children 0-16) (>1 Person Per Room)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Argentina	2009	20	44	9	12	20	42	8	11
Bolivia	2007	8	51	4	4	7	47	3	4
Brazil	2008	78	13	10	69	78	13	10	68
Chile	2006	71	14	10	61	70	13	9	61
Costa Rica	2009	63	19	12	51	63	19	12	51
Dominican Republic	2008	28	39	11	17	26	39	10	16
Ecuador	2006	44	31	14	30	43	30	13	30
El Salvador	2007	13	53	7	6	12	50	6	6
Guatemala	2006	6	65	4	2	6	62	4	2
Honduras	2007	30	40	12	18	30	39	12	18
Jamaica	2002	11	54	6	5	11	51	6	5
Mexico	2008	41	32	13	28	40	31	13	28
Nicaragua	2005	5	62	3	2	5	59	3	2
Panama	2003	18	51	9	9	17	49	8	9
Paraguay	2008	17	45	8	9	16	43	7	9
Peru	2008	19	39	7	12	18	37	7	12
Uruguay	2008	37	37	13	23	35	35	12	23
Venezuela	2005	22	43	9	12	21	43	9	12

Source: Author's calculations based on SEDLAC data

Table A3.7B: HOI Freedom from Overcrowding in Selected Countries

Human Opportunity Index: Freedom from Overcrowding (Children 0-16) (>1 Person Per Room)									
Country	Year	Assets included as circumstances				Assets not included as circumstances			
		Coverage	Dissimilarity	Penalty	HOI	Coverage	Dissimilarity	Penalty	HOI
Mongolia	2000	3	53	2	1	3	52	2	1
Jordan	2004	9	57	5	4	9	57	5	4
Rwanda	2002	10	53	5	4	10	53	5	4
Armenia	2001	9	37	3	6	9	37	3	6
Ghana	2000	9	35	3	6	9	34	3	6
Kyrgyz Republic	1999	12	41	5	7	12	40	5	7
Kenya	1999	13	37	5	8	13	34	4	9
Venezuela	2001	20	40	8	12	19	38	7	12
Belarus	1999	17	35	6	11	17	29	5	12
Romania	2002	18	33	6	12	18	33	6	12
Hungary	2001	27	29	8	19	27	28	8	19
South Africa	2001	30	34	10	20	30	30	9	21
Slovenia	2002					33	18	6	27
Greece	2001	40	23	9	31	39	22	9	31
Italy	2001	43	24	10	33	43	23	10	33
Portugal	2001	60	17	10	49	60	16	10	50
France	1999					73	12	9	64
Austria	2001	80	10	8	72	80	8	6	73
USA	2000	81	10	8	73	81	9	7	74
Spain	2001	82	7	6	76	82	7	6	76

Source: Author's calculations based on IPUMS data

Table A3.8: Human Opportunity Index, Census: USA [1960 – 2005]

Human Opportunity Index: US, 1960 - 2005 (Children 0-16)						
Index	Census Year					
	1960	1970	1980	1990	2000	ACS 2005
Housing						
Freedom from severe overcrowding	79	88	93	91	88	95
Freedom from moderate overcrowding	50	60	76	77	74	80
Access to Sanitation. (public system)	39	68	66	70	NA	NA
Access to Sanitation. (public system + septic tanks)	76	95	97	99	NA	NA

Source: Estimates produced based on census (IPUMS), 1960 - 2005.

Table A3.9: Human Opportunity Index, Annual Change: USA [1960 – 2005]

Human Opportunity Index: USA, 1960 - 2005 (Children 0-16)								
Index	Annual Change							
	1960-1970	1970-1980	1980-1990	1990-2000	2000-2005	1960-1980	1980-2005	1960-2005
Housing								
Freedom from severe overcrowding	0.8	0.5	-0.2	-0.3	1.4	0.7	0.1	0.3
Freedom from moderate overcrowding	0.9	1.7	0.1	-0.3	1.3	1.3	0.2	0.7
Access to Sanitation. (public system)	2.9	-0.2	0.3	NA	NA	1.4	NA	NA
Access to Sanitation. (public system + septic tanks)	1.9	0.2	0.1	NA	NA	1.1	NA	NA

Source: Estimates produced based on census (IPUMS), 1960 - 2005.

Table A3.10: Human Opportunity Index, Census: FRANCE [1962 - 1999] †

Human Opportunity Index: FRANCE [1962 - 1999]					
Index	Census year				
	1968	1975	1982	1990	1999
Housing					
Freedom from severe overcrowding (> 1.5 per room)	55	n.a.	n.a.	87	90
Freedom from overcrowding (>1 per room)	21	n.a.	n.a.	59	64
Access to Sanitation (public connection only)	52	61	69	n.a.	n.a.

Source: Estimates produced based on census (IPUMS), 1962 - 1968 - 1975 - 1982 - 1990 - 1999

† Analyses for children from 0 to 16 years old

Table A3.11: Human Opportunity Index, Annual Change: FRANCE [1962 - 1999] †

Human Opportunity Index: FRANCE [1962 - 1999]					
Index	Annual Change				
	1968-1975	1975-1982	1990-1999	1968-1982	1968-1999
Housing					
Freedom from severe overcrowding (> 1.5 per room)	n.a.	n.a.	0.6	n.a.	0.8
Freedom from overcrowding (>1 per room)	n.a.	n.a.	1	n.a.	1
Access to Sanitation (public connection only)	0.9	0.8	n.a.	0.9	n.a.

Source: Estimates produced based on census (IPUMS), 1962 - 1968 - 1975 - 1982 - 1990 - 1999

† Analyses for children from 0 to 16 years old

Figure A3.1: HOI for Reading

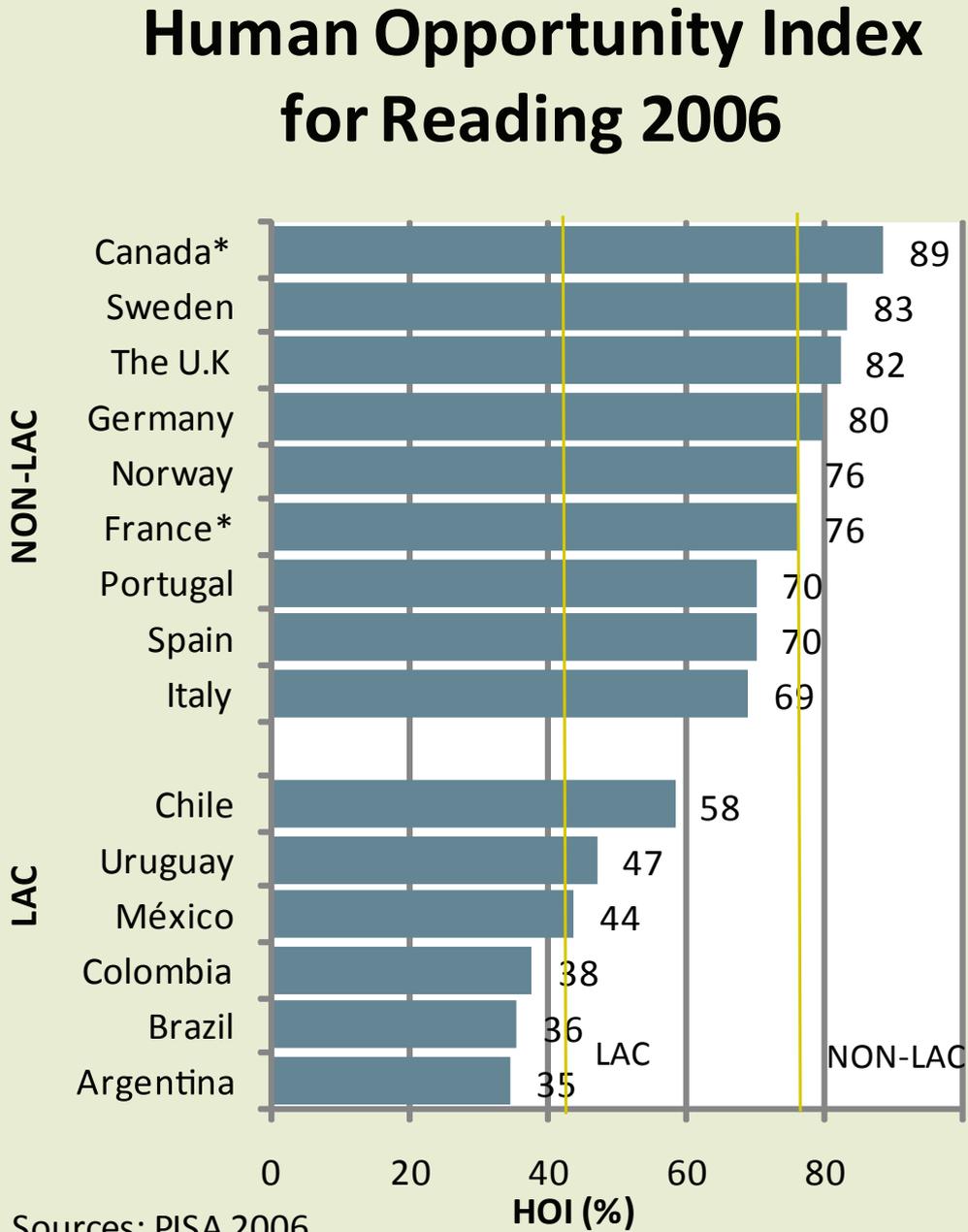
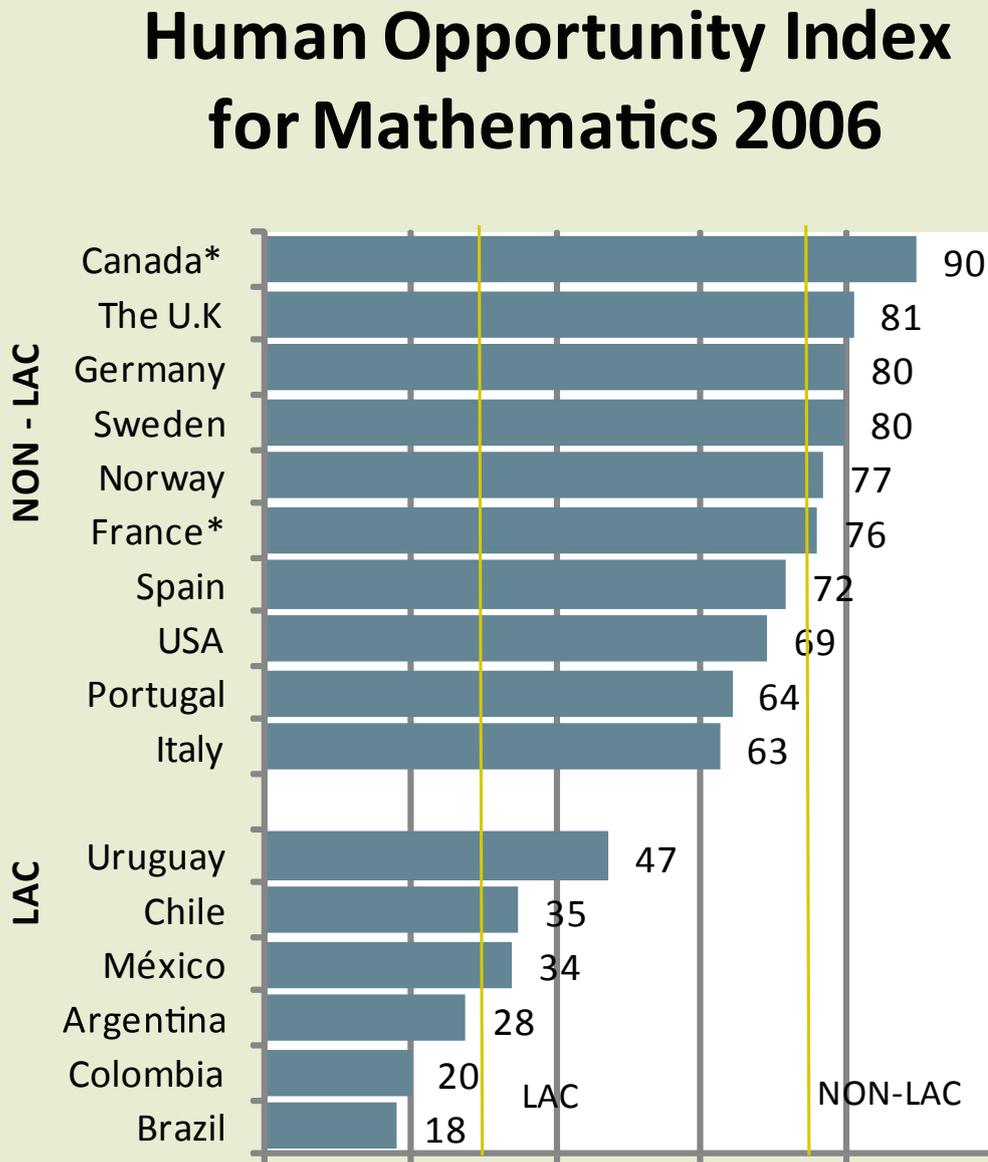


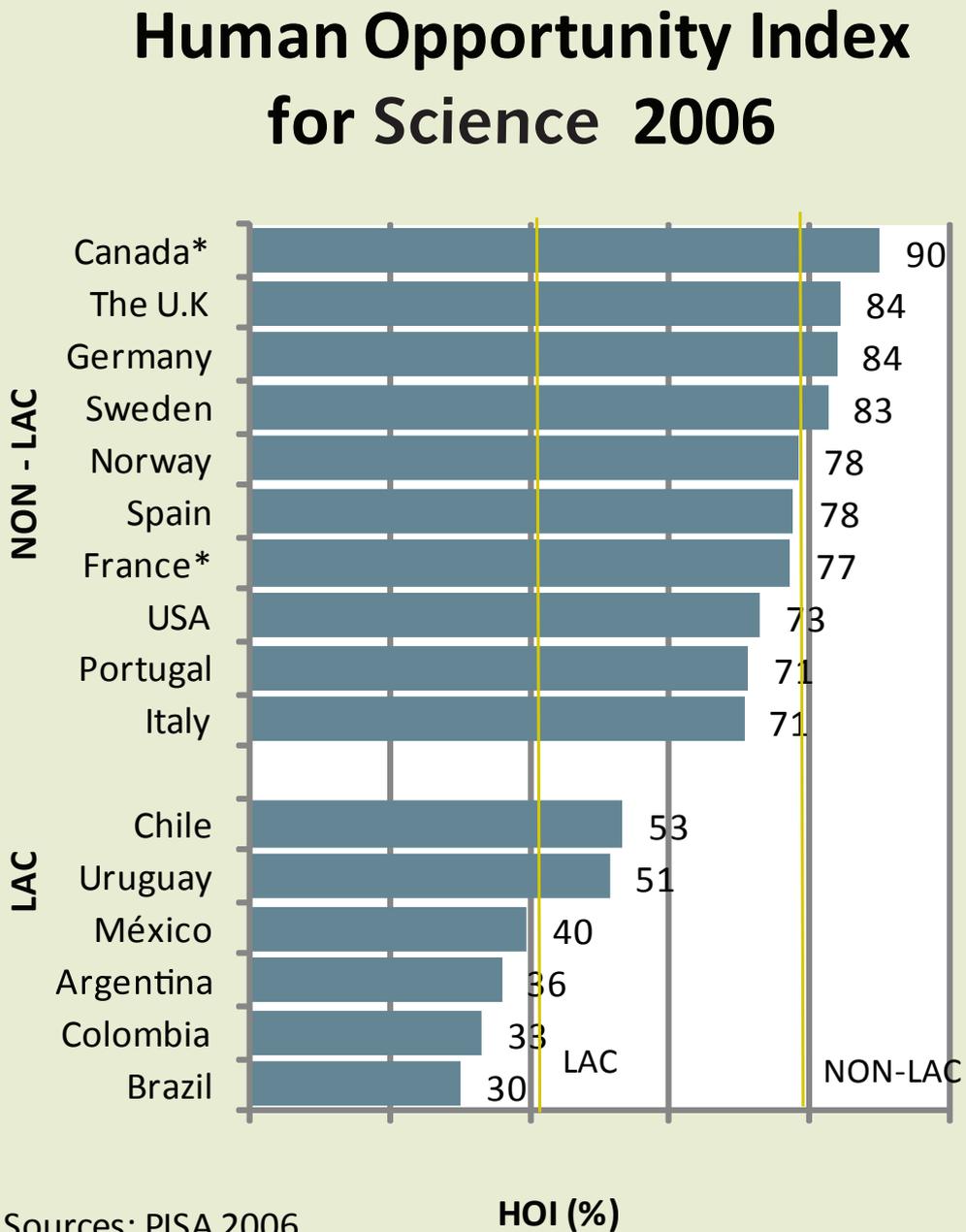
Figure A3.2: HOI for Mathematics



Sources: PISA 2006

* Canada and France don't include school location as circumstance

Figure A3.3: HOI for Science



Sources: PISA 2006

* Canada and France don't include school location as circumstance



ANNEXES

Chapter 4

Table A4.1. Countries, Provinces or Sub-Regions and Years

Countries, Provinces or Sub-Regions and Years				
Country	Survey years		Provinces	Sub-Regions
Argentina	1998	2008	23	
Brazil	1995	2008	27	
Chile	1996	2006	13	
Colombia	1997	2008	9	
Costa Rica	1994	2009		6
Dominican Republic	2000	2008		9
Ecuador	1995	2006		3
El Salvador	1998	2007	14	
Guatemala	2000	2006		8
Honduras	1999	2007		5
Nicaragua	1998	2005		4
Panama	1997	2003	10(9)	
Paraguay	1999	2008	16 (9)	
Peru	1998	2008		7
Uruguay	2006	2008	19	
TOTAL			123	42

Source: The World Bank and Universidad de La Plata (CEDLAS) Socioeconomic Database for Latin American and the Caribbean

Table A4.2: Regional/Sub-national HOIs 2008

Ranking	Region	HOI	Ranking	Region	HOI
1	Tierra del Fuego - ARG	96	29	San Luis - ARG	90
2	Bogota DC - COL	95	30	La Pampa - ARG	90
3	Antofagasta - CHI	95	31	Libertador General B - CHI	89
4	Mendoza - ARG	94	32	Colonia - URUG	89
5	Tarapacá - CHI	94	33	Lima metropolitana - PERU	89
6	Atacama - CHI	94	34	Catamarca - ARG	89
7	Metropolitana de San - CHI	94	35	Rio Negro - URUG	89
8	Aysen del General Ca - CHI	93	36	Bio-Bio - CHI	89
9	Salta - ARG	93	37	Treinta y tres - URUG	89
10	La Valleja - URUG	93	38	Salto - URUG	89
11	Santa Cruz - ARG	93	39	Entre Rios - ARG	88
12	Montevideo - URUG	93	40	Orinoquia y Amazonia - COL	88
13	Chubut - ARG	93	41	Tacuarembó - URUG	88
14	Valparaiso - CHI	93	42	Maule - CHI	88
15	Cordoba - ARG	92	43	Canelones - URUG	88
16	Coquimbo - CHI	92	44	Florida - URUG	87
17	City of Buenos Aires - ARG	92	45	Chaco - ARG	87
18	Neuquen - ARG	92	46	La Rioja - ARG	87
19	Soriano - URUG	92	47	Rivera - URUG	87
20	Durazno - URUG	92	48	Maldonado - URUG	87
21	Cerro Largo - URUG	91	49	Tucuman - ARG	87
22	Artigas - URUG	91	50	Santa Fe - ARG	87
23	Flores - URUG	91	51	Bs As - ARG	87
24	Rocha - URUG	90	52	Paysandu - URUG	87
25	Central - CRICA	90	53	San Jose - URUG	86
26	Valle del Cauca - COL	90	54	Los Lagos - CHI	86
27	Magallanes y la Antá - CHI	90	55	Formosa - ARG	86
28	Corrientes - ARG	90	56	Costa urbana - PERU	86

Ranking	Region	HOI	Ranking	Region	HOI
57	Brunca - CRICA	85	85	Espirito Santo - BRA	78
58	Paraná - BRA	85	86	Central - COL	78
59	San Paulo - BRA	85	87	Rio de Janeiro - BRA	77
60	Jujuy - ARG	85	88	Selva urbana - PERU	77
61	San Juan - ARG	85	89	San Pedro Sula - HOND	77
62	Sierra urbana - PERU	85	90	Oriental - COL	76
63	Araucania - CHI	84	91	Amapá - BRA	75
64	Central - PARAG	84	92	Roraima - BRA	75
65	Santiago del Estero - ARG	83	93	Región Cibao Central - DOMIN.REP.	75
66	Santa Catarina - BRA	83	94	Herrera - PANAMA	75
67	Asunción - PARAG	83	95	Paraguarí - PARAG	74
68	Pacífico Central - CRICA	83	96	Tegucigalpa (Dist.Nac) - HOND	74
69	Distrito federal - BRA	83	97	Chiriquí - PANAMA	73
70	Chorotega - CRICA	82	98	Cordillera - PARAG	72
71	Región Distrito Naci - DOMIN.REP.	82	99	Rio Grande du Norte - BRA	72
72	Huetar Atlantica - CRICA	82	100	Costa - ECU	72
73	Rio Grande du Sul - BRA	82	101	Rondonia - BRA	72
74	Sierra* - ECU	82	103	Sergipe - BRA	72
75	Colón - PANAMA	81	104	Metropolitana - GUAT	72
76	Misiones - ARG	81	105	Los Santos - PANAMA	72
77	Goiás - BRA	81	106	Alto Parana - PARAG	72
78	Panamá - PANAMA	80	107	Atlantica - COL	71
79	Mato Grosso Sul - BRA	80	108	Pacifica - COL	70
80	Huetar Norte - CRICA	80	109	Paraíba - BRA	69
81	Mato Grosso - BRA	79	110	Managua - NICA	69
82	Antioquia - COL	78	111	San Salvador - EL SALV.	69
83	Región Norcentral - DOMIN.REP.	78	112	Ceará - BRA	68
84	Minas Gerais - BRA	78	113	Amazonas - BRA	68

Ranking	Region	HOI	Ranking	Region	HOI
114	Ciudades medianas - HOND	68	142	Pacífico - NICA	55
115	Coclé - PANAMA	67	143	Itapúa - PARAG	54
116	Bahia - BRA	67	144	Suroccidente - GUAT	53
117	Región Este - DOMIN.REP.	67	145	Santa Ana - EL SALV.	52
118	Región Noroeste - DOMIN.REP.	67	146	Chalatenango - EL SALV.	51
119	San Andres y Provide - COL	67	147	La Paz - EL SALV.	51
120	Pernambuco - BRA	67	148	San Vicente - EL SALV.	50
121	Región Nordeste - DOMIN.REP.	66	149	Nororiente - GUAT	50
122	Tocantins - BRA	66	150	Cuscatlán - EL SALV.	49
123	Para - BRA	65	151	Usulután - EL SALV.	49
124	Región Valdesia - DOMIN.REP.	65	152	Suroriente - GUAT	49
125	Oriente/Amazonia - ECU	64	153	Sonsonate - EL SALV.	48
126	Caaguazú - PARAG	63	154	Selva rural - PERU	47
127	San Pedro - PARAG	63	155	Darién - PANAMA	47
128	Alagoas - BRA	63	156	San Miguel - EL SALV.	47
129	Guairá - PARAG	62	157	Noroccidente - GUAT	44
130	Ciudades pequeñas - HOND	61	158	Cabañas - EL SALV.	44
131	Maranhao - BRA	61	159	Ahuachapán - EL SALV.	44
132	Piauí - BRA	61	160	La Unión - EL SALV.	42
133	Costa rural - PERU	60	161	Peten - GUAT	40
134	Región del Valle - DOMIN.REP.	60	162	Central - NICA	40
135	Sierra rural - PERU	59	163	Rural - HOND	38
136	Acre - BRA	58	164	Norte - GUAT	33
137	Veraguas - PANAMA	58	165	Morazán - EL SALV.	33
138	Central - GUAT	58	166	Atlántico - NICA	29
139	Bocas del toro - PANAMA	57			
140	Región Enriquillo - DOMIN.REP.	56			
141	La Libertad - EL SALV.	55			

Source: The World Bank and Universidad de La Plata (CEDLAS) Socioeconomic Database Survey years for Latin American and the Caribbean

Figure A4.1: Housing HOI Circa 1995 and 2008

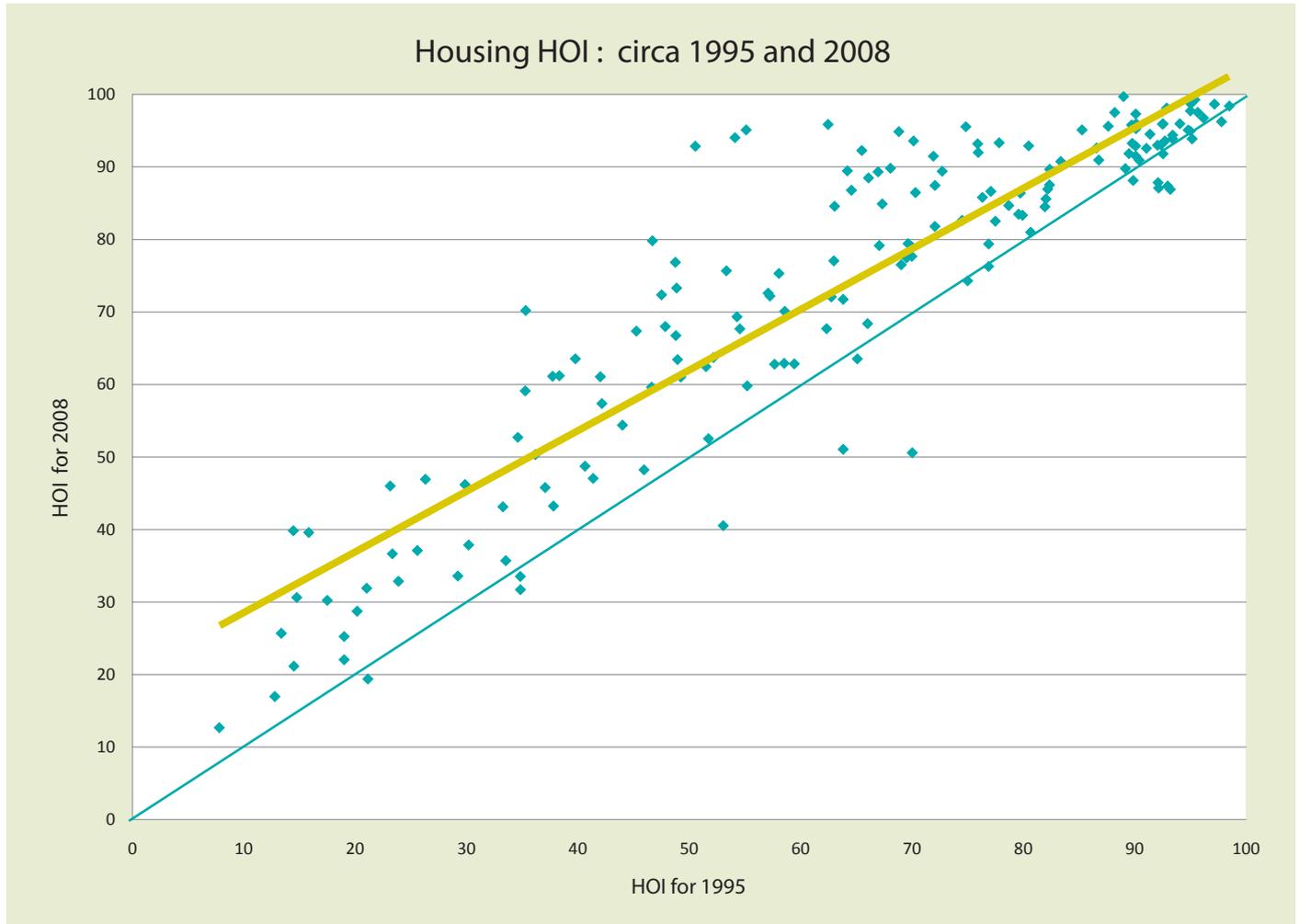


Figure A.4.2: Education HOI Circa 1995 and 2008

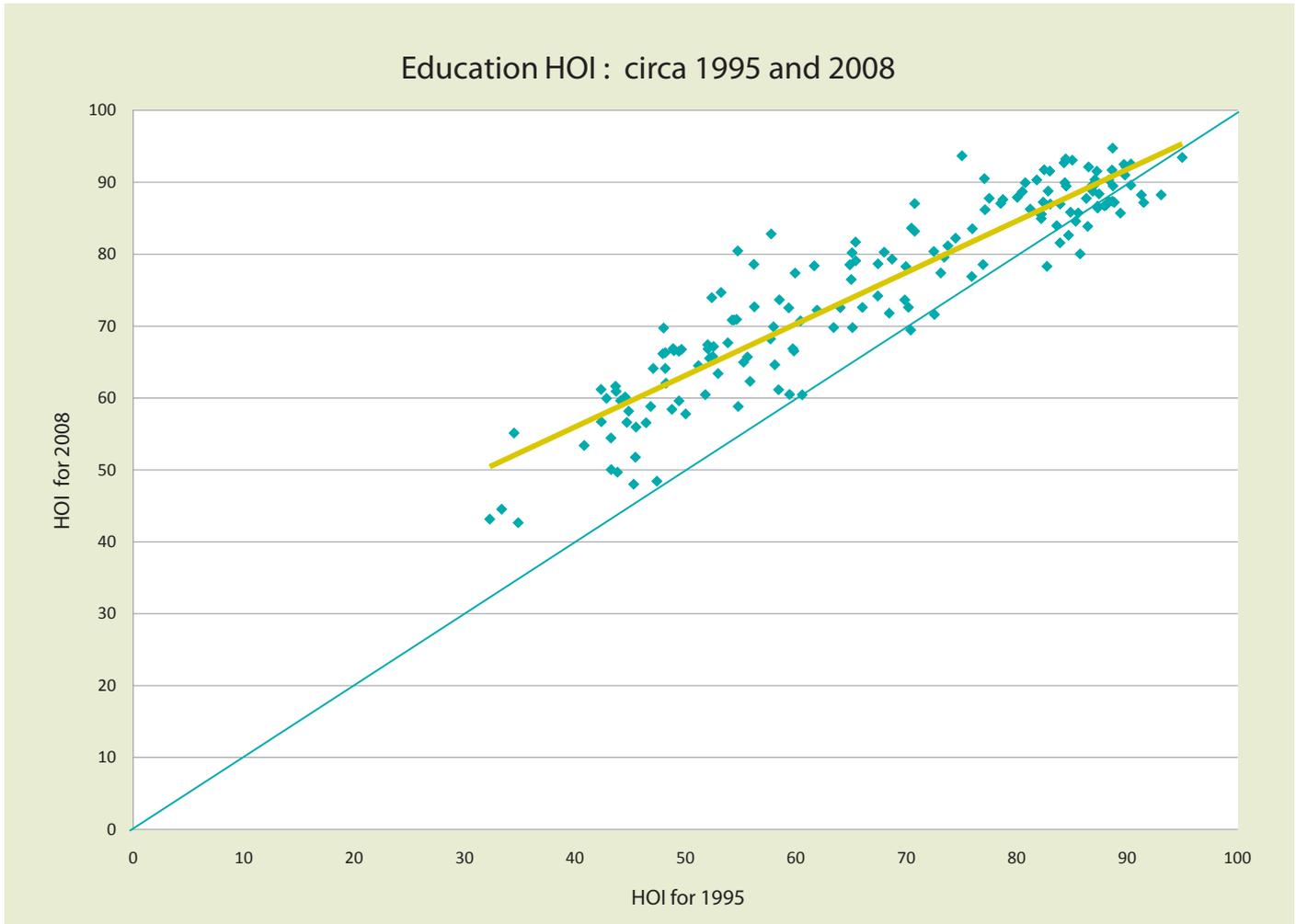
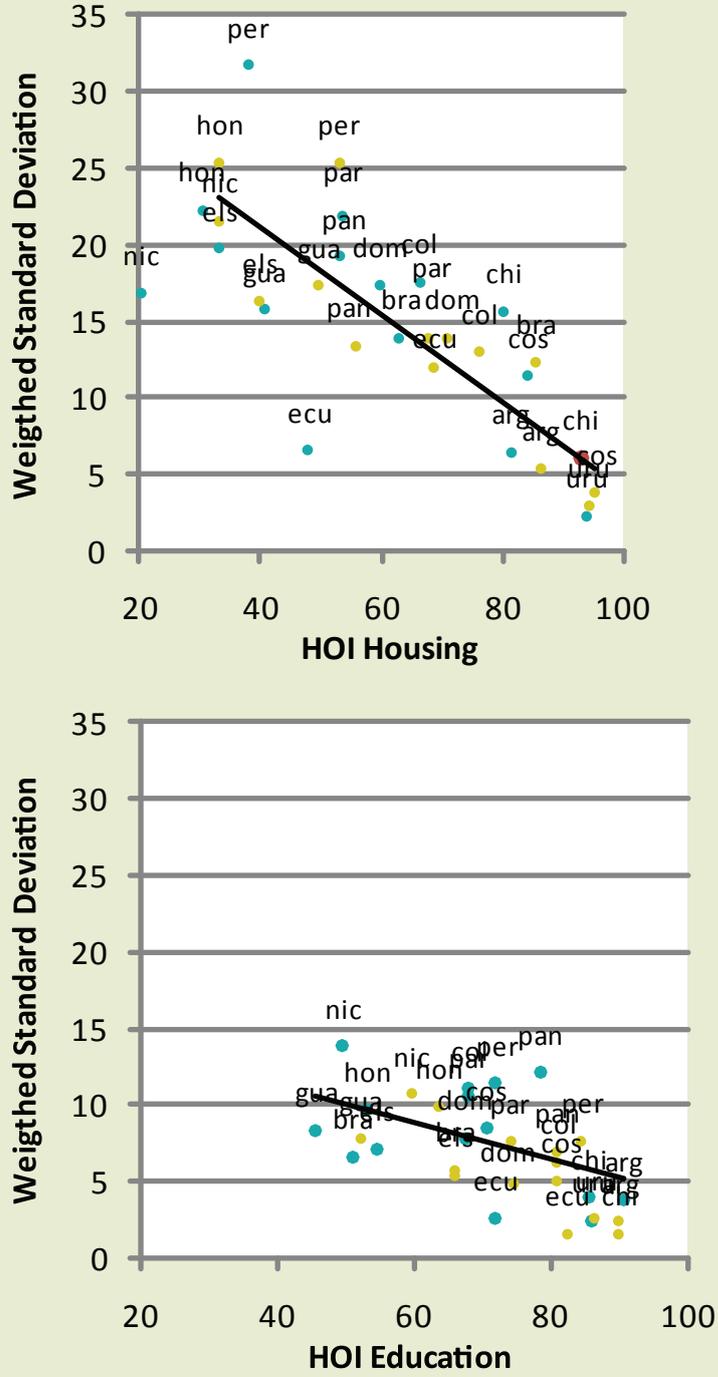
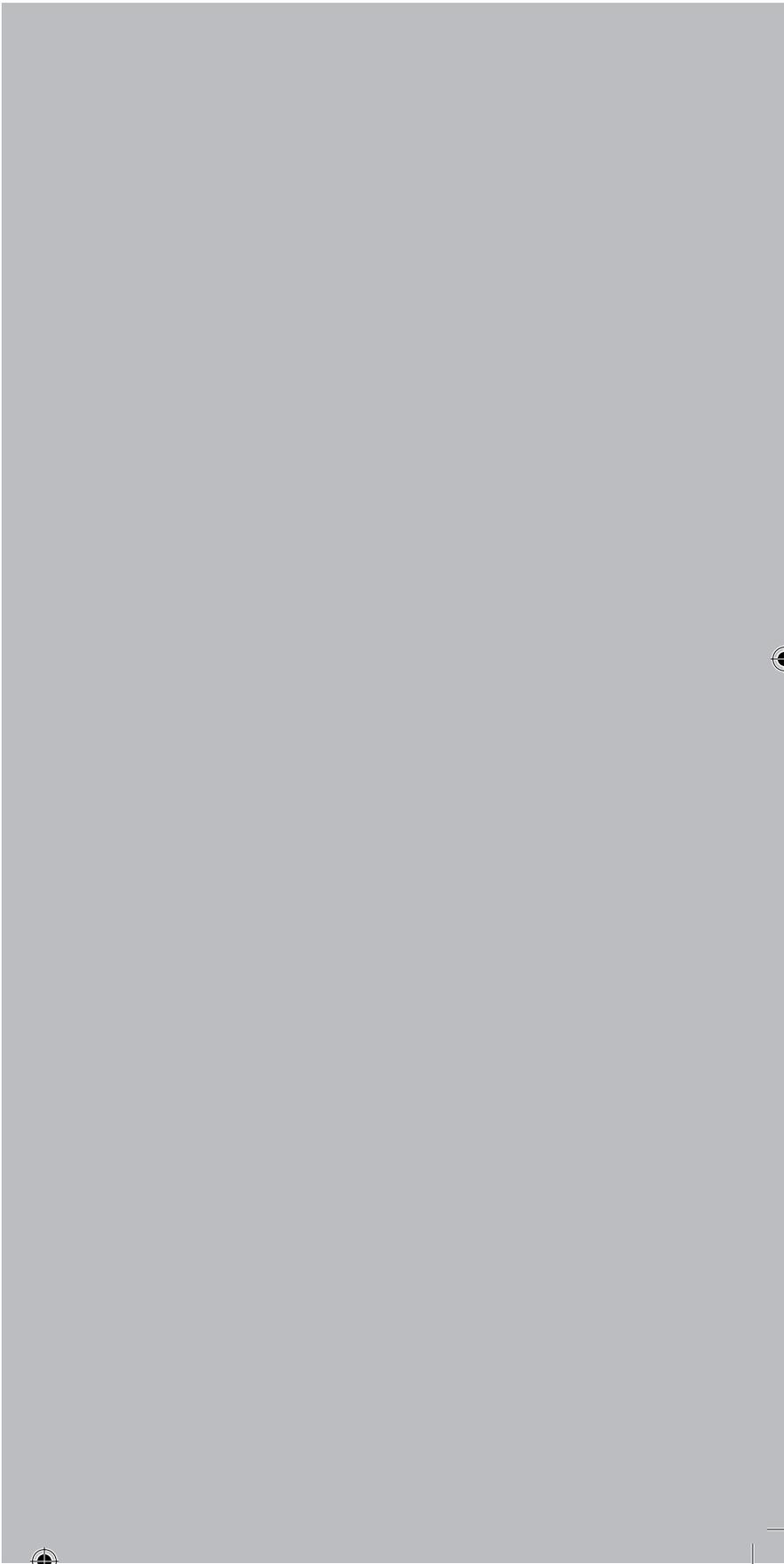


Figure A.4.3: Dispersion and Education and Housing HOI



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